2013

USER´S MANUAL
DOUGLAS-8000

COMPACT SYSTEM DSP CONTROLLED

REMOTE MONITORING AND CONTROL

MUSICSON®

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DOUGLAS-8000

COMPACT LINE-ARRAY SYSTEM

1.- Safety instructions for admittance in the product's User's Manual

• Read the information for use (user manual).
• Please keep the user manual in a safe place during the lifetime of the product. The user manual forms an integral part of the product. Reselling of the product is only possible if the user manual is available. Any changes made to the product have to be documented in writing and passed on to the buyer in the event of resale.
• Heed all warnings.
• Follow all instructions.
• Do not use this product near water (for example, in damp rooms or near a swimming pool).
• Clean only with dry cloth.
• Do not cover the heat sink. Install in accordance with the user manual.
• Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
• Protect the power cord from being walked on, pinched or damaged in any other way. Pay particular attention to plugs and the point where they exit from the Amplifier Unit.
• The product may only be used in accordance with the information provided in the user manual. Before and during the usage of the amplifier please ensure that all recommendations, especially the safety recommendations in the user manual, are adhered to. The Amplifier Unit is designed for the amplification of pulsed audio signals and the Amplifier Unit should only be connected to speakers with an average impedance that is not lower than the impedances specified in the User's Manual.
• Do not place the product on an unstable cart, stand, tripod, bracket, or table. The device may fall, causing serious injury, and serious damage to the device itself.
• The Amplifier Unit can only be disconnected from the power supply by removing the plug, which must be freely accessible at all times. Unplug this Amplifier Unit during lightning storms or when unused for long periods of time.
• Refer all servicing to qualified service personnel.

Damages that require service

Unplug the Amplifier Unit from the mains supply and refer to your dealer/distributor or other authorised repair workshop. Servicing is required when
1. The power-supply cord or plug has been damaged,
2. Liquid has been spilled or objects have fallen into the amplifier,
3. The amplifier has been exposed to rain or moisture,
4. The amplifier has been dropped or suffered damage in any other way,
5. The amplifier exhibits a distinct change from its normal function or performance.

Servicing

Do not attempt to service this product yourself. As opening or removing covers may expose you to dangerous voltage or other hazards, the amplifier may only be opened by qualified personnel. Please refer to your dealer/distributor.

Servicing and Replacement Parts

All service and repair work must be carried out by an authorised dealer/distributor. When replacement parts are required, please ensure that the dealer/distributor only uses replacement parts specified by the manufacturer. The use of unauthorised replacement parts may result in injury and/or damage through fire or electric shock or other electricity-related hazards.

Safety Check

Upon completion of any service or repairs to this product, ask the dealer/distributor to perform safety checks to determine that the amplifier is in proper operating condition.

Read the information for use

When shipping the product, always use the original shipping carton and packing materials. For maximum protection, repack the unit as it was originally packed at the factory.

Environments

Use this product only in E1, E2, E3 or E4 environments according to EN55103-2 “Electromagnetic compatibility – Product family standard for audio, video and audio-visual and entertainment lighting control apparatus for professional use – Part 2: Immunity”

Ventilation and heat sink

The heat sink is provided to ensure reliable operation of the Amplifier Unit and to protect it from overheating. The heat sink must not be blocked or covered. This product should not be installed unless proper ventilation is provided or manufacturer’s instructions have been adhered to.

Water And Moisture

Do not use this product near water (for example, in damp rooms or near a swimming pool).

Cleaning

Unplug the Amplifier Unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners.

Power-cord Protection

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon them or against them, paying particular attention to cords and plugs, and the point where they exit from the Amplifier Unit.

Lightning

For added protection of the product during lightning storms, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges. Disconnection from the mains power supply can only be achieved by removing the plug from the mains socket and by external disconnection of all poles from the mains.

Interference of external objects and/or liquids with the appliance

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the amplifier.

Accessories

Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury, and serious damage to the product. Any mounting of the product should follow the manufacturers instructions, and should use a mounting accessory recommended by the manufacturer.

Connecting

When you connect the Amplifier Unit to other equipment, turn off the power and unplug all of the equipment from the supply source. Failure to do so may cause an electric shock and serious personal injury. Read the user's manual of the other equipment carefully and follow the instructions when making the connections.

Sound Volume

Reduce the volume to minimum before you turn on the amplifier to prevent sudden high levels of noise which may cause hearing or speaker damage.

SPEAKON connectors

WARNING: SPEAKON connectors marked with the lightning flashes indicate high voltages that are potentially life threatening.

Wiring to these terminals requires installation by an instructed person and the use of ready-made leads or cords. Custom wiring should only be carried out by qualified personnel.
To prevent electric shock, do not operate the product with any of the conductor portion of the speaker wire exposed.

NOTE: For reasons of safety and performance, use only high-quality fully insulated speaker cables of stranded copper wire. Use the largest wire size that is economically and physically practical, and make sure the cables are no longer than necessary.

Precautions when connecting to MAINS IN and MAINS LINK

When mounting or connecting the product always disconnect it from mains. Only connect the product to an appropriate AC circuit and outlet, according to the requirements indicated on the rating plate.

If a power cut occurs while the amplifier is switched on, it will restart automatically once the power supply has been restored. All settings prior to the loss of power will be maintained.

IMPORTANT: Always connect the Product to mains through the MAINS IN connector on the Amplifier Unit.

IMPORTANT: Always use ready-made mains cables with original POWERCON connectors when connecting the product to mains.

IMPORTANT: When disconnecting the Product from the mains, always disconnect at the mains end first, before disconnecting the PowerCon connector at the Product end.

IMPORTANT: Only connect additional Products to the MAINS LINK connector keeping within the specified power rating. Always use ready-made mains link cables with original POWERCON connectors.

DO NOT REMOVE MAINS CONNECTOR GROUND, IT IS ILLEGAL AND DANGEROUS.

2.- Declaration on conformity - international EMC directives

For admittance in the product's User's Manual
The purpose of this section is to state the important declarations on conformity in accordance with international EMC and EMI directives, which must be entered into the User's Manual for the final selfpowered loudspeaker.

EC Declaration of Conformity in accordance to EC Directives

electro-magnetic compatibility (Council Directive 89/336/EEC, as amended by Directives 92/31/EEC and 93/68/EEC);

low-voltage electrical equipment (Council Directive 73/23/EEC)

This product conforms to the following standards:

EN55103-1 Emission
EN55103-2 Immunity

The operating conditions and application environments presupposed in the information for use (user manual) are to be kept accordingly.

3.- INTRODUCTION TO OWNERS MANUAL

This Owner´s Manual has been divided in 3 Sections to facilitate user right an easier comprehension about his product in order to obtain maximum performance:

1.- Product Manual; in which user can find all points related with final assembled product Operation.
2.- DSP Command Centre Software Installation
3.- Ethernet connection: Control, Grouping and On-Line Monitoring Signals

4.- SYSTEM OVERVIEW

Douglas 8 system represents one of the latest MUSICSON line array system developments, responding to the market demands: powerful, reliable, flexible and small format reinforcement sound systems.

MUSICSON has designed Douglas 8 system to be used either by rental companies for small to mid-sized venues as well as in fixed installation for musicians or Dj´s looking for extremely compact size, portability and very easy set up. Its crystal clear audio performance, extremely constant frequency response over distance, controlled dispersion and incredible SPL to size ratio makes Douglas 8 system a perfect choice to any kind of event.

Douglas 8 has been designed with all necessary hardware to ensure a quick and easy configurable line array system to achieve any kind of requirements: from stand-alone cabinets to more complex flown or stacked line array and subwoofer system.

Douglas 8 system is composed of:

1.- **Douglas 8** compact line array element.
2.- **BP-212** Subwoofer
3.- **MX-8000D** DSP Controlled Power Amplifier.

1.- DOUGLAS-8 LINE ARRAY

2.- BP-212 SUBWOOFER

3.- MX-8000D SYSTEM AMPLIFIER

5.- Douglas 8

Douglas-8 is an extremely compact 8” two way line-array element with an amazing SPL to size ratio.

MUSICSON has developed a new slightly curved high way acoustic lens to provide a controlled and phase-coherent wave-front with an extreme mid and high frequencies definition and sonic accuracy.

- *Powerful 2 way compact line-array system*
- *New MUSICSON neodymium magnet transducers*
- *Precise vertical coverage control due to new acoustical lens*
- *Exceptional SPL to size ratio*
- *Versatile, easy to fly and carry.*

Douglas-8 features a new premium MUSICSON neodymium high SPL transducers:

1. One 8” lightweight speaker assembled with a 2” (52mm) long excursion voice coil with a powerful 4” Neodymium magnet.
2. One High frequency Transducer. Consist on a powerful 1.75” polymer diaphragm to increase very high frequency response with less distortion than metallic ones but increasing lifespan due to higher resistance to mechanical fatigue. Assembled in a new MUSICSON proprietary wooden made acoustic lens for a slightly curved wave-front.

New DOUGLAS-8 features an integrated flying hardware with 0º to 14º splay angle adjustment allowing a precise vertical system coverage.

Specifications

Frequency Response	76Hz – 19.5KHz (± 3 dB) 70Hz – 20KHz (- 10 dB)
Horizontal coverage	90 deg. Up to 16 KHz (-6 dB); 110 deg. Up to 16 KHz (-10 dB)
Vertical Coverage	Individual : 15º (-10dB / 16KHz) System: Number of boxes and splay angles dependant
Components	LF: 1 x 8”: 2” (52mm) Voice Coil. 4” Nedymium magnet HF: 1 x 1.75”. Compression driver. Polymer diaphragm. 3.5” Nedymium magnet
Impedance	LF: 16Ω HF: 16Ω
X-Over Frequency	1700 Hz
Power Handling	LF: 1 x 200W RMS / 1 x 800W Peak HF: 1 x 80W RMS / 1 x 320W Peak
Sensitivity	LF: 96dB (1W/1m) / 126dB (Peak) HF: 107dB (1W/1m) / 132dB (Peak)
Dimensions	(Height x Width x Depth) : 238 x 480 x 315 mm
Weight	11.5Kg
Cabinet	12mm Marine Plywood
Finish	Black Bi-Component Poly-Impact® Polyurea based
Grille	1mm perforated Steel. Black Epoxy painted
Rigging System	Inside box integrated flying hardware
Cabinet angles	From 0º to 14º. From 0º to 6º in 1º steps and from 6º to 14º in 2º steps

Frequency Response (1W/1m)

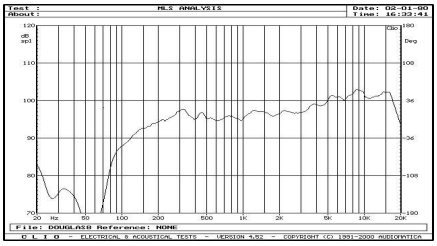


Figure shows Douglas-8 Frequency Response
In anechoic conditions.
Mic. placed at 1m distance from cabinet on axis
An MLS signal was used with 4V output amplitude

Impedance Curves

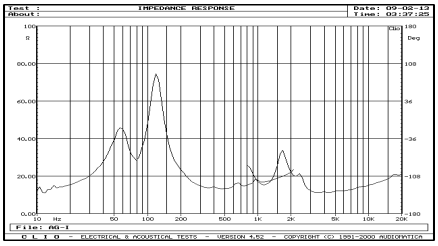
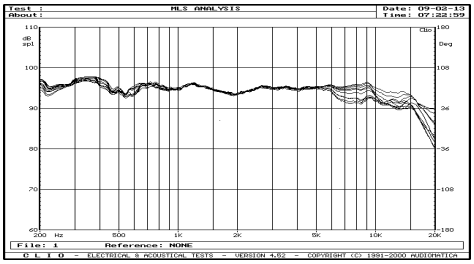


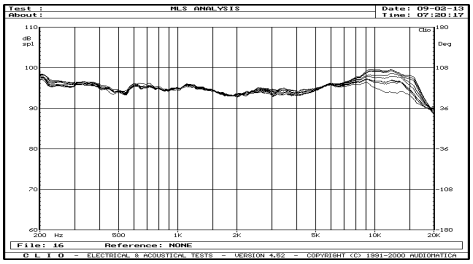
Figure shows both Low and High Impedance ways.
Measurements made with 4V constant output voltage

Vertical Coverage Curves

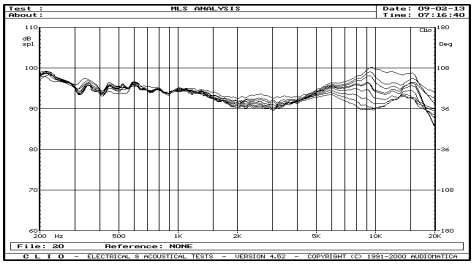
Figures show 4 Douglas-8 units in typical J-Shape configuration. Microphone was placed in a distance of 4 meters from array.
A ½ octave smoothing filter applied. All graphs from 200Hz to 20KHz
Each Frequency curve was obtained along array length each 5cm from top to bottom 4 units Douglas-8.



1.- Shows 4 units placing microphone from top to 1/3 array length.

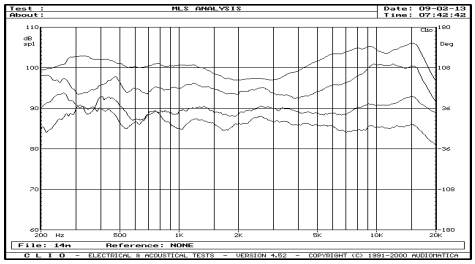


2.-Shows 4 units placing microphone in array main lobe region.



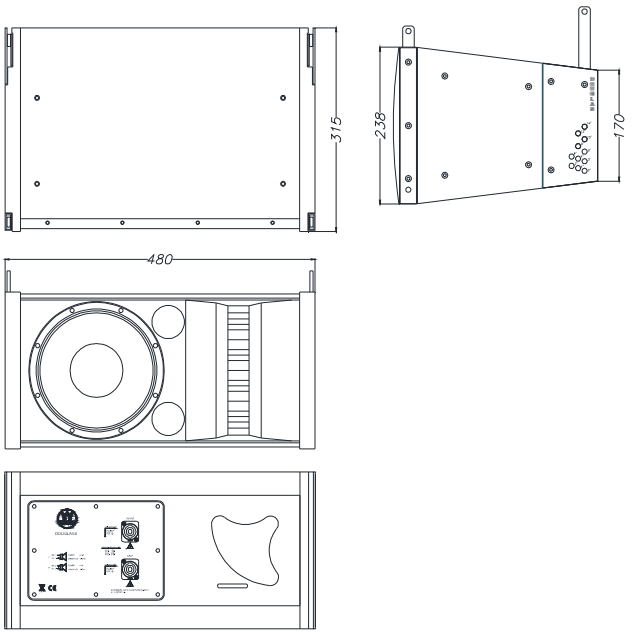
3.- Shows 4 units placing microphone from bottom to 1/3 array length.

Frequency Response over Distance

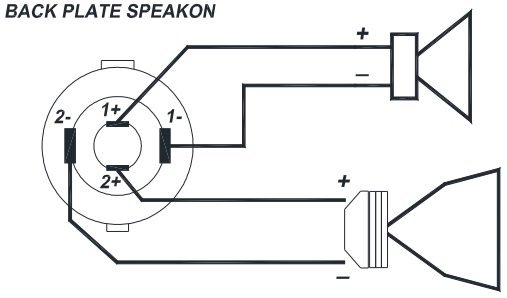


Shows 4 units placing microphone
At 2m, 4m, 8m and 16m from array.

MEASURES



BACK PLATE DIAGRAM CONNECTIONS



8" LF

1.75"HF

Douglas-8 Line-array is a Bi-Amplified system. Both signals should be connected to 4 pin in NL4MP back plate Speakon.
+1 y -1 NL4MP Speakon should be connected directly to 8” Low Frequency Transducer.
+2 y -2 NL4MP Speakon should be connected directly to 1.75” High Frequency Compression Driver.

Second NL4MP Speakon in back plate is paralleled connected and should be used to connect a second Douglas-8 unit.

6.- BP-212: **Subwoofer** is a 6º order Double Band-Pass designed Subwoofer containing two powerful 12" long excursion drivers. Band-Pass design deliver higher SPL levels in a narrow bandwidth, minimizing speaker maximum excursion. BP-212 can either be used as ground stacked or flyable subwoofer equipped with an integrated rigging hardware.

- *6º order Band-pass subwoofer system design*
- *Two powerful long excursion 12" drivers*
- *3" double-sided voice coil technology*
- *Integrated rigging hardware*
- *Designed for use in arrays with DOUGLAS-8.*

Specifications

Frequency Response	39.5Hz – 120Hz (- 3 dB) 35.5Hz – 130Hz (- 6 dB)
Components	LF: 2 x 12" cone treatment . 3" (77mm) Double-sided voice coil
Power Handling	2 x 500W RMS / 2 x 2000W Peak
Sensitivity	101dB (1W/1m) / 138dB (Peak)
Impedance	8Ω
Dimensions	(Height x Width x Depth) : 885 x 485 x 670 mm
Weight	48.5Kg
Cabinet	18 y 15mm Marine Plywood
Finish	Poly-impact®. Black Bi-component Polyurea based
Grille	1.5mm perturated Steel. Black Epoxy painted

BP-212 Frequency Response

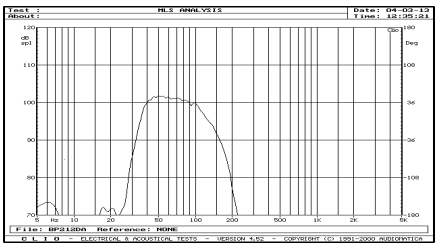


Figure shows BP-212DA Frequency Response
Mic. Placed at 1m in anechoic conditions with a 2.82V
Filters and correction applied in MX-8000D Amplifier

BP-212 Impedance Response

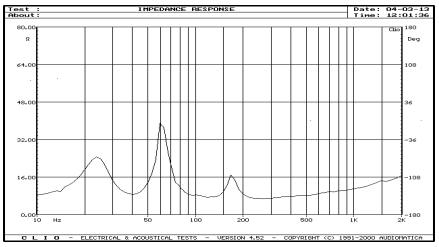
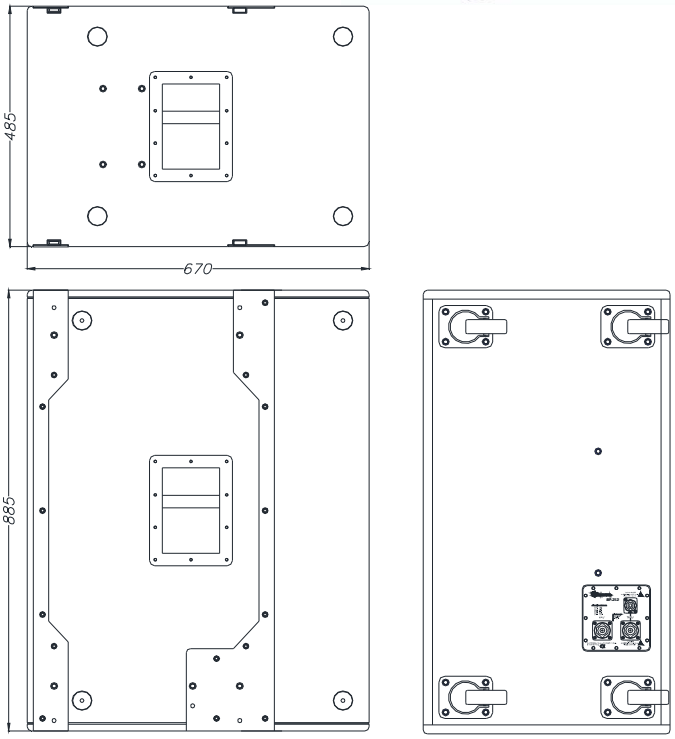
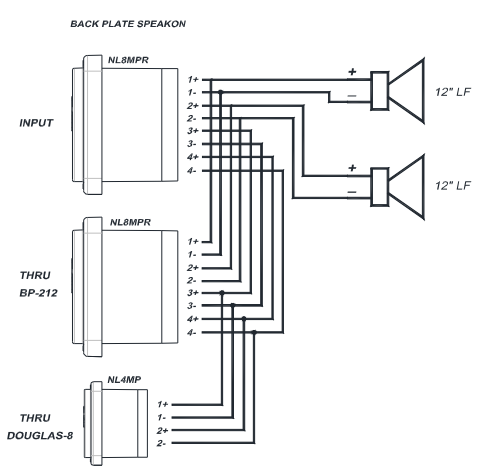


Figure shows BP-212 Impedance curve
With a constant 2,82V output voltage

BP-212 Measures



BACK PLATE DIAGRAM CONNECTIONS



7.- MX-8000D is a dual channel 12000 W Peak 3rd Generation Power Modules featuring 2 powerful 96KHz, 64 processing bits DSP Input modules with all necessary configuration adjustments and functions to power a complete DOUGLAS 8 system: from a basic stand-alone Douglas 8 to a complete BP-212 Subwoofer and Douglas 8 line array.

- *Total Output Power: 2 x 2400W + 2 x 800W + 2 x 800W*
- *Dual 96KHz, 64 bits DSP Input boards*
- *Remote Control and Monitoring capabilities: Software available*
- *Dual Universal Switch Mode Power Supply*
- *Total weight: 14.2Kg*

Input DSP modules have analogue Input/Link XLRs connector as well as Remote Control and Monitoring capabilities through Ethernet interface connectors in a Star Network configuration. Digital AES/EBU input signals are available under specific customer order.

MX-8000D features a 2 front panel displays, blue characters, with a precise information about Factory presets and system parameters adjustments, together with an encoder to control system presets and 5 led´s with each channel Input signal level information.

MX-8000D include a dual Universal Switch Mode Power Supply with automatic mains voltage selection from 85V to 265V delivering consistent power worldwide, fully self-protected and capable to power up to 2 units of BP-212 Subwoofer and 5 units line array DOUGLAS-8 each channel. MX-8000D DSPs include also all necessary Presets for any possible DOUGLAS 8 system configuration.

User is allowed via Musicson Platform Control and Monitoring Software, select most convenient Factory Preset to optimize Douglas 8 system performance depending on number of BP-212 and Douglas 8 line array cabinets used in any kind of event. There are up to 10 Equalization filters (Bell, Notch, Low-pass, High-pass, Band-Pass, Low-Shelf, High-Shelf) as well as Input Gain, Delay and Limiter per channel user definable.

Power Modules Specifications

Amplification	2x4000W Continuous (2x2400W+2x800W+2x800W) 2x6000W Peak Clase D 3ª Generación
Output Voltages	LF: 160Vp / MF: 80Vp / HF: 80Vp loaded
S/N Ratio	Better than 120dB (A-weighted, 20Hz–20KHz, 8Ω loaded)
THD+N	<0.05% (20Hz-20KHz, 8Ω loaded, 3 dB below rated power)
Frequency Response	20Hz-20KHz ±0.15dB (8Ω loaded, 1dB below rated power)
Damping Factor	>1000 (8Ω loaded, 1KHz)
Protection circuits	Input Limiter, Short circuits, DC of outputs, Under & over voltage, Temperature,
Operation Voltage	Universal , Automatic Selection : 85 – 268VAC 50/60Hz
Measures	(Height x Width x Depth) 88 x 483.5 x 555mm
Weight	14.2Kg

DSPs Specifications

DSP Processing	96KHz, 64 bit DSP
Latency	600 µs
Signal Connectors	XLR Female / XLR Male (Link)
Nominal Input Signal	+6dBu
Max. Input Signal	+23dBu
Network connectors	Etherconn RJ/45, Cat-5 y USB
Network	10/100Mb Ethernet
Remote Control	Via Display y PC (User Software Included)
Remote Control Parameters	Input Gain, Mute, Input Delay up to 800ms (275m) Input Limiter, Input/Outputs Signal Monitoring
Dynamic Range	120dB (Input) / 117dB (Outputs)

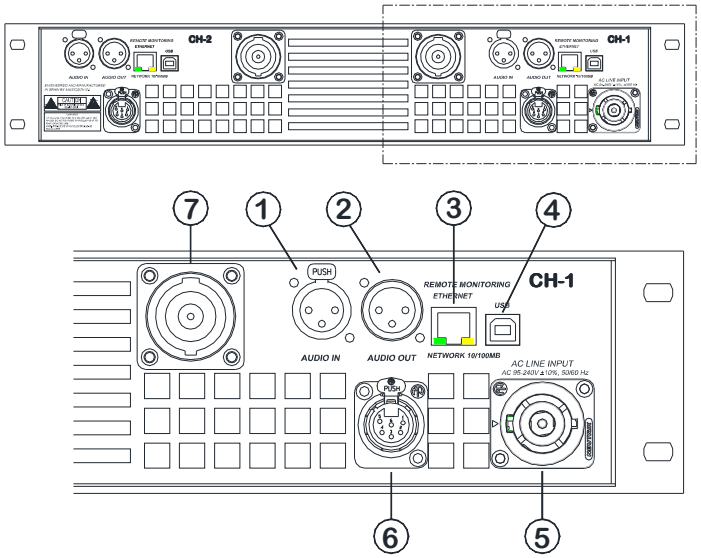
MX-8000D FRONT PANEL VIEW

MX-8000D REAR PANEL VIEW

8.- MX-8000D REAR PANEL.

Next, User will find a quick guide about all connectors and controls in MX-8000D amplifier back panel. Please, read carefully all this points to ensure a proper understanding of all components related with DSP and Power modules.

Please, follow instructions and read carefully advices and warnings comments. Only one channel will be described in this section



8.1.- AUDIO IN CH1/CH2

Neutrik XLR-3 pin female connector for Input Signal to DSP module. Input signal module use a electronic balanced signal to reject noises on cables. This are codes for 3 pin connector:
- pin 1 : GND
- pin 2 : Signal (+)
- pin 3 : Signal (-)

Under special customer request, digital AES/EBU inputs are available in MX-8000D amplifier.

Warning!: Please, check that all your signal cables follows right codes to avoid polarity changes. If any of this cables change polarity in any cabinet, an important degradation in frequency response and coverage in all system will occur.

8.2.- AUDIO OUT CH2/CH2

Neutrik XLR-3 pin male connector for Output Signal to next Falcon-12DA cabinet. Input signal module use a electronic balanced signal to reject noises on cables. This are codes for 3 pin connector:
- pin 1 : GND
- pin 2 : Signal (+)
- pin 3 : Signal (-)

8.3.- ETHERNET NETWORK CONNECTOR (RJ45)

RJ45 Ethercon for DSP Star Network Control and Monitoring capabilities using DSP COMMAND CENTER SOFTWARE.
Please, refer to DSP Controls Chapter and DSP Command Center Software in this Manual

8.4.- USB CONNECTOR

Use this connector only in case of new DSP Software Release Version appear for your system. In this case, a new version of Firmware for DSP should be upload for Control and Monitoring functions.
Please, refer to DSP Controls Chapter and DSP Command Center Software in this Manual.
Any new Software Release, will appear in Musicson webpage (www.musicson.com) in which user will find concrete instructions to download and Install them, as well as necessary Factory Presets.

8.5.- AC LINE INPUT

MX-8000D amplifier features a 32 Amperes Neutrik Powercon for AC Mains. Musicson supply an AC Mains cable cord assembled together 32 Amperes Neutrik Powercon Connector using a correct wire sizes.

Warning!: Do not replace supplied AC cable cord by others with less section: this will not support total amplifier consumption. In case of using any other connector to plug unit to AC Mains, please be sure it can support 32 Amperes.

8.6.- DSP AUDIO OUT CH1/CH2

MX-8000D features a Neutrik 6-pin XLR connector to supply slave MX-8000 (without DSPs) amplifiers 3 Output Signals directly from Input DSps including X-Over Frequencies, Optimization Filters, Delay, Limiting adjustments, for a cost effective system extensions. Please, consult Musicson I+D Department for a proper use.

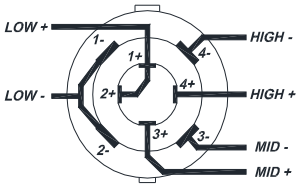
Pin codes are:

- PIN 1 : Low signal ouput (+)
- PIN 2 : Low signal GND
- PIN 3 : Mid signal output (+)
- PIN 4 : Mid signal GND
- PIN 5 : High signal output (+)
- PIN 6 : High signal GND

8.7.- CH1/CH2 OUTPUT

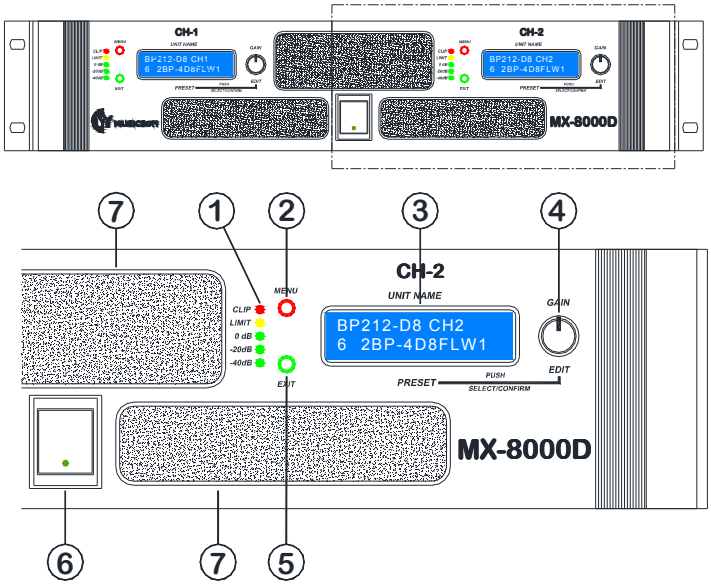
8-pin Neutrik NL8MPR type connector with MX-8000D Output Signals. Pin codes are:

- PIN 1 (+) : Low powered Output (+)
- PIN 1 (-) : Low powered Output (-)
- PIN 2 (+) : Not connected
- PIN 2 (-) : Not connected
- PIN 3 (+) : Mid powered Output (+)
- PIN 3 (-) : Mid powered Output (-)
- PIN 4 (+) : High powered Output (+)
- PIN 4 (-) : High powered Output (-)



9.- MX-8000D FRONT PANEL

Please, read carefully all this points to ensure a proper understanding of all components related with DSP and Power modules to optimize MX-8000D features and options.
Only one channel will be described in this section



9.1.- INPUT SIGNAL LEVEL LEDs

5 leds for Input Signal Gain Monitoring. When switch on unit, all leds will constantly light until all initial DSPs test procedures are finished.

3 Green leds for Input signal for -40dB, -20dB and 0dB Input signals.
1 LIMIT Yellow led that lights when Input Limiter is acting.
1 CLIP Red led that lights when Input signal arriving to DSP module is distorted.

Warning!: To ensure a good sound quality with very low distortion levels and protect transducers, CLIP red led never should be ON. User is allowed to Remote Monitoring Input Signal Level via Musicson Software.

9.2.- "MENU" PUSHBUTTON

Pushbutton for DSP MENU Options. Please, refer to DSP Controls Section in this Manual.
Press **"MENU"** pushbutton to select most convenient **Factory Preset** depending on DOUGLAS-8000 system configuration.

9.3.- DISPLAY

It´s a User Interface to inform in 2 lines about "**UNIT NAME"** and selected **FACTORY PRESET.** Sirve como Interfaz de usuario para visualizar el "Nombre de la Unidad" y el "Preset de Fábrica" seleccionado en las actuales condiciones de uso. It´s a blue color backlit screen with black characters. User is allowed via Musicson Software to choose between 3 display configuration:

1.- ON: Default configuration. Display backlit remains always ON.
2.- OFF: Display backlit will change to OFF.
3.- DIMM: Display backlit dimmer. Will reduce intensity compared with standard ON position.

9.4.- ENCODER GAIN/EDIT

Total Encoder for EDITING and SELECTING DSP functions by pushing and rotating.
Gain adjust INPUT from -40dB (Mute) to +12dB.
Please, refer to DSP Controls Chapter in this Manual for further information

Warning!: Please, do not select extreme INPUT GAIN values. It will sure distort your system Sound quality. As a general rule for an optimized Sound, please Factory Presets selected Gain.

9.5.- "EXIT" PUSHBUTTON

Pushbutton for EXIT from DSP MENU Options. Please, refer to DSP Controls Section in this Manual.

Advice: Supplied Musicson Software is a valuable tool for Monitoring and Control Signals. Musicson strongly recommend to use Software whenever possible. You will find all necessary information and control over the system in a very easy to use and user friendly graphical interface. Limit screen pushbuttons and controls to display UNIT NAMES and FACTORY PRESETS selected.

9.6.- ON-OFF SWICHT

Switch On and Off unit. In ON Position, switch will light in green colour.

9.7.- COOLING WINDOWS

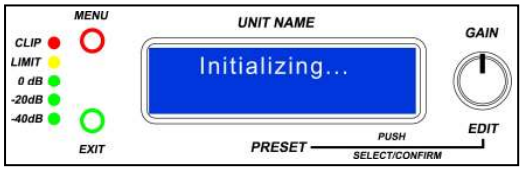
Placed in Front and Rear panel as well as in both sides. Rear panel cooling windows let inside 4 high performance fans to intake fresh air from outside.

Warning!: Please, keep cooling front windows and rear and sides slots without any obstacle that may inhibit air flow. In that case, power amplifier temperature will quickly increase limiting output power for its own protection and reducing significantly DOUGLAS-8000 performance and quality.

10.- FRONT PANEL DISPLAY CONTROL FACTORY PRESETS SELECTION

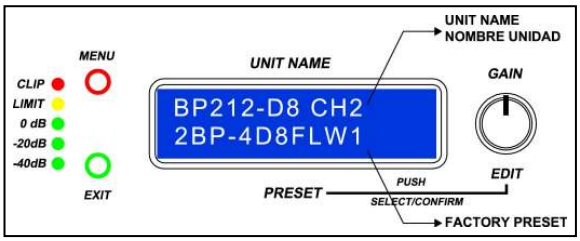
MX-8000D Input DSPs can be controlled via supplied Musicson DSP Software or via front panel display controls: pushbuttons and encoder. Front panel Display control options will be described in this section. Both **"Menu"** and **"Exit"** pushbuttons feature a double RED and GREEN leds to check functions. There is also a total encoder (rotate and push functions) to select and confirm DSP parameters.

Selection and Loading most convenient Factory Presets depending on DOUGLAS-8000 system configuration basically are main functions of MX-8000D front panel display controls.



As soon as system is switched on and during first 15 seconds, DSP and power modules start all initial procedures to check all functions and load all parameters corresponding to last loaded Preset.
During this time, no sound will come out from system and all Input Signal Level leds will Light. Also, message **" Initializing… "** will appear in system Display.

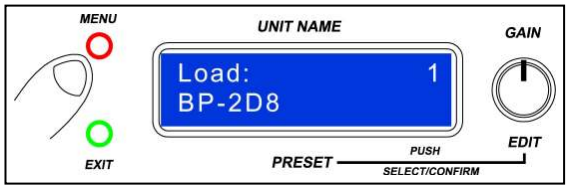
As soon as this initial check is finished and system is ready , display will show last loaded PRESET as well as UNIT NAME. UNIT NAME is user selectable and can be changed via Musicson SOFTWARE.
Display will show last Factory Preset selected. Also will keep all DSP parameters configured last time system was used.
Please, refer to DSP Command Center Software in this Manual

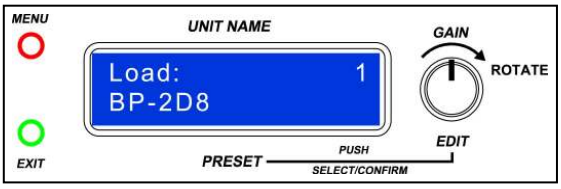


CHANGING FACTORY PRESETS

Please, follow next steps to change to most convenient Factory Preset depending on DOUGLAS-8000 system configuration (refere to DOGLAS-8000 CONFIGURATION on this Manual) using front panel display controls:

1.- Push **"MENU"** and rotate Encoder **"GAIN/EDIT"** until most desires Factory Preset appear in display screen:



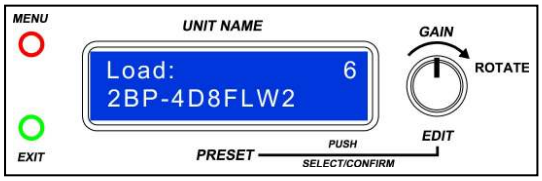


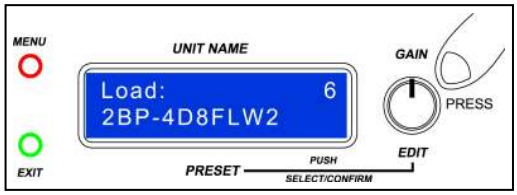
Sequence for Number and Name Factory Presets is as follow:

PRESET Nº 1 : **BP-2D8** ---------- PRESET Nº 2: **BP-2D8STC** ---------- PRESET Nº 3: **BO-2D8FLW1**
PRESET Nº 4 : **BP-2D8FLW2** ------- PRESET Nº 5: **2BP-4D8FLW1** -------- PRESET Nº 6: **2BP-4D8FLW2**

The other 74 remaining PRESETS are free for user. Correct way to create new USER PRESETS is via MUSICSON DSP CONTROL SOFTWARE. Please, refer to Musicson DSP Control Software in this Manual.

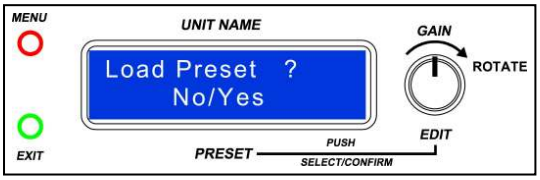
2.- Once displayed most convenient Factory Preset: Push Encoder **"GAIN/EDIT"** .

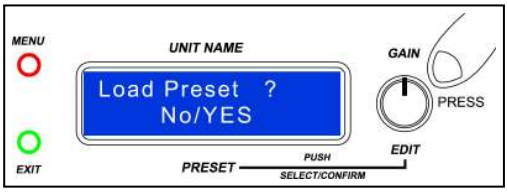




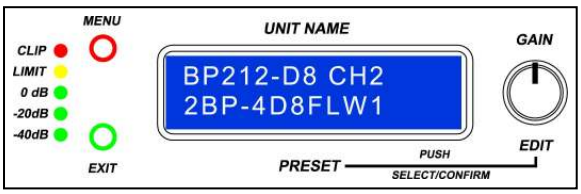
System will ask to confirm loading process. Rotate then Encoder **GAIN/EDIT** to select **"Yes"**; words will change to capital leters.

3.- Push Encoder **GAIN/EDIT** once more. DSP will load selected Factory Preset.





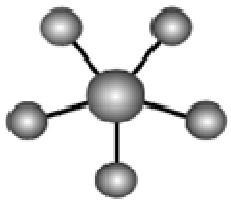
In case of a mistake in Factory Preset selection, user is allowed to push "**EXIT**" pushbutton to go back to previous sequence.
Finally, selected Factory Preset will be displayed on front panel DSP screen



11.- MUSICSON DSP CONTROL SOFTWARE

11.1.- INTRODUCTION. STAR NETWORK TIPOLOGY

MUSICSON MX Series Amplifiers offers the possibility to design a Star Network configuration via Etherconn RJ45 already supplied and installed in Input DSP Board.



Star network

A Star Network is a local area network (LAN) in which all nodes (MX Series Amplifiers) are directly connected via CAT5 cable to a common central Computer. With this Network topology, all MX Amplifiers will be WIRED or WIRELESS linked to Computer by using a Hub or a Switch or a Musicson PWM-15; a 15-Port Wireless Ethernet Switch , so it´s very easy to add or remove connected units.

In a Star Network, a cable failure will isolate ONLY the unit linked to computer with this cable. All other devices will continue to function normally.
If any unit connected in this Network goes down, none of the other units will be affected.

All signals coming from / to any device to central computer goes directly without crossing through any other device in the net so, communication speed is highest compared with other network topologies.

MUSICSON DSP CONTROL SOFTWARE, supplied with MX Series Amplifier, allows user both:

1.- On-Line real-time INPUT PARAMETERS CONTROL over all MX Series Amplifiers connected in the network, including FACTORY PRESETS loading and GROUPING Functions. Please, refer to MCDS Section in this Manual.

2.- On-Line Real-Time Input/Output Signals and Limiters Monitoring over all MX Series Amplifiers connected in the network, as well as each Output channel Impedance Load and Power modules Temperature. Please, refer to MDCS Section in this Manual.

MUSICSON DSP CONTROL SOFTWARE (MDCS) allows user to open as many Monitoring and Control windows as MX Series Amplifiers Channels connected in the network. User can assign a UNIT NAME to any Amplifier in network (It will also appear in front panel Display) to identify all units.

Software detects automatically all IP Addresses in the net and display all information required in opened window.
User can open or close each Amplifier Channel Control or Monitoring window as well as leave all them opened at same time.

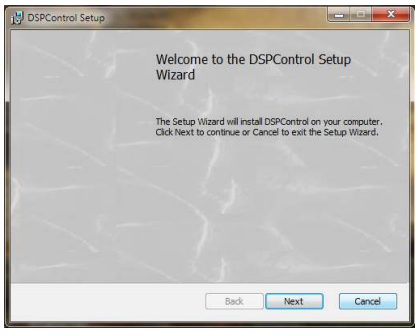
11.2.- MUSICSON DSP CONTROL SOFTWARE INSTALLATION

MUSICSON strongly recommend to install MUSICSON DSP CONTROL SOFTWARE for all MX Amplifiers Series for Monitoring and Control Input/Output Signals via CAT5 cable (wired through an Ethernet Switch or wireless by using new Musicson PWM-15 module). It´s a powerful, friendly and easy to use system Remote Control tool including a well designed Graphical User Interface featuring also important parameters monitoring such as both amplifiers channel Temperature and Impedance Load. Musicson DSP Con Software.
Following operating Systems are supported:

- Windows XP with Service Pack 2
- Windows 7
- Mac OS-X 10.5.8 or higher

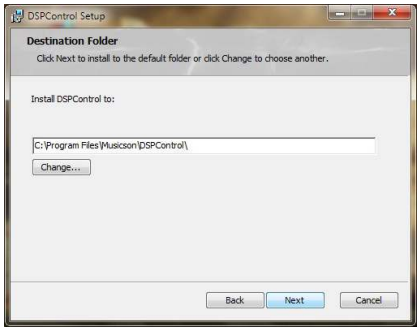
To install Software, please, follow this simple steps:

1.- After downloading Musicson DSP Control from Musicson website (www.musicson.com) open package. The installer will guide you through installation procedures.


DSPControl Setup
Welcome to the DSPControl Setup Wizard
The Setup Wizard will install DSPControl on your computer. Click Next to continue or Cancel to exit the Setup Wizard.
Back
Next
Cancel

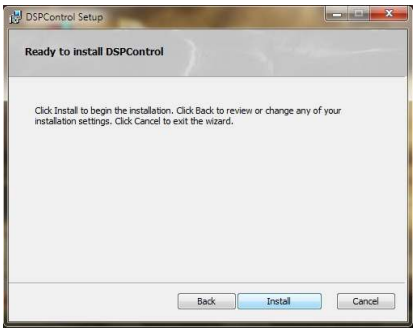
2.- Please, accept terms in the Licence Agreement by clicking in right place.
Maybe, in some moments of installation procedure, a message from windows can appear if you have a firewall activated.
Please, go on with installation and select go on anyway.

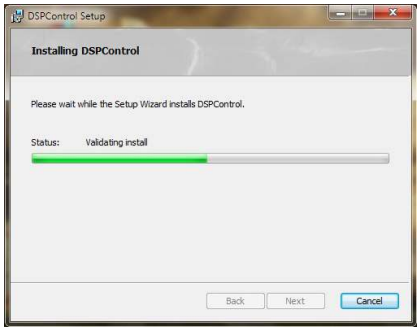
DSPControl Setup
End-User License Agreement
Please read the following license agreement carefully
Software License Agreement
Definitions:
Licensor: Vendor of the hardware accompanying this software, or the person or company that has made this software available (directly or indirectly) to Licensee.
Licensee: The person or company using this software.
Copyright (c) 2010 by Licensor. All rights reserved.
I accept the terms in the License Agreement
Print
Back
Next
Cancel



3.- Select the folder where you wish to have Musicson DSP Control Software installed:
By default: Musicson\DSPControl

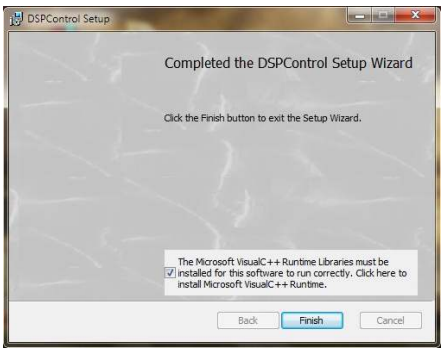
4.- Select NEXT and go on with installation process.


DSPControl Setup
Ready to install DSPControl
Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.
Back
Install
Cancel

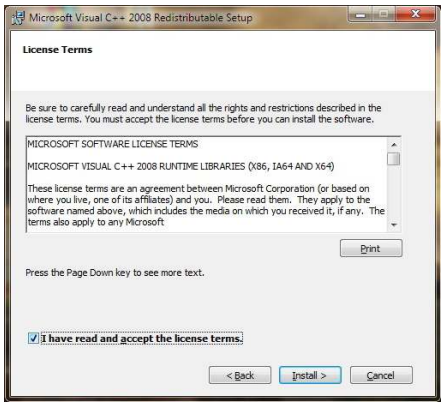


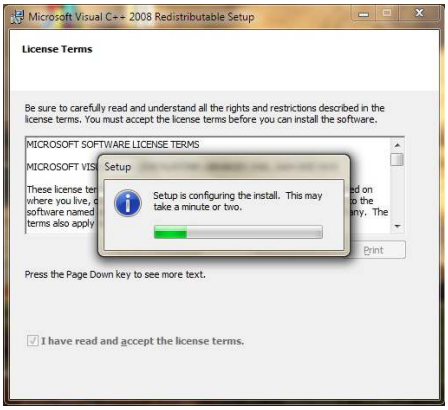
5.- Now, installation will start.
System will need some minutes to finish installation process.

6.- Once installation is finished, installer will ask to install also Microsoft VisualC++ Runtime to run software correctly; please accept installation as shown in next figures.


DSPControl Setup
Completed the DSPControl Setup Wizard
Click the Finish button to exit the Setup Wizard.
The Microsoft VisualC++ Runtime Libraries must be installed for this software to run correctly. Click here to install Microsoft VisualC++ Runtime.
Back
Finish
Cancel

9.- Finally, accept Microsoft License Terms and click on “Install”. After finishing all this steps, you will see a new icon in your Desktop to launch Musicson DSP Control Software.


Microsoft Visual C++ 2008 Redistributable Setup
License Terms
Be sure to carefully read and understand all the rights and restrictions described in the license terms. You must accept the license terms before you can install the software.
MICROSOFT SOFTWARE LICENSE TERMS
MICROSOFT VISUAL C++ 2008 RUNTIME LIBRARIES (X86, IA64 AND X64)
These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft
Print
Press the Page Down key to see more text.
I have read and accept the license terms.
< Back
Install >
Cancel


Microsoft Visual C++ 2008 Redistributable Setup
License Terms
Be sure to carefully read and understand all the rights and restrictions described in the license terms. You must accept the license terms before you can install the software.
MICROSOFT SOFTWARE LICENSE TERMS
Setup
Setup is configuring the install. This may take a minute or two.
Print
Press the Page Down key to see more text.
I have read and accept the license terms.

Warning!: On some Windows 7 versions, user will need to run the Software as “Administrator” to connect with hardware correctly. To change to this mode, click with right pushbutton of your mouse and select “Properties”. Then, select “compatibility” and finally “Run this program as Administrator”.

12.- MUSICSON DSP CONTROL SOFTWARE (MDCS) MANAGEMENT

12.1.- INTRODUCTION

MX-8000D amplifier is fully equipped from MUSICSON with Ethernet solution via RJ45 connectors in its back panel as well as DSP COMMAND CENTER SOFTWARE for network capabilities to enable complete ***filters*** configuration, ***control***, convenient cabinets ***grouping*** and ***monitoring*** solutions. With its intuitive and easy-to-use graphical interface, Musicson DSP Control Software provides remote (wired or wireless) access to load also FACTORY or USER PRESETS.

Each MX-8000D channel must be connected to a 100BaseT Ethernet switch using a standard CAT-5 cable. Personal Computer to run control with Musicson Dsp Control Software must also be connected by 100BaseT connector to the switch or using a wireless access point on the same network.

Using a wireless access point to manage Network will require additional TCP/IP protocols in user Computer as well as specific Ethernet configurations.

12.2- MDCS: QUICK START
CONNECTING MX-8000D FOR THE FIRST TIME

Even if you have experience in handling control and monitoring software systems, it´s hardly recommended for MX-8000D users to follow this instructions with initial test configurations starting with simplest networking. Musicson Dsp Control Software is a powerful and reliable control and monitoring platform which can be used in any **Musicson** system using Input Dsp´s modules.

Note: To avoid any communication errors, please, avoid connecting the switch to any other Ethernet equipment than speaker/s and Control Computer.

Warning!: If you are using a wireless access point with a Ethernet switch to control and monitoring your MX-8000D system, please, NEVER use 100BaseT network connector in your Control Computer for other Network uses.

Follow next steps for a single MX-8000D unit network:

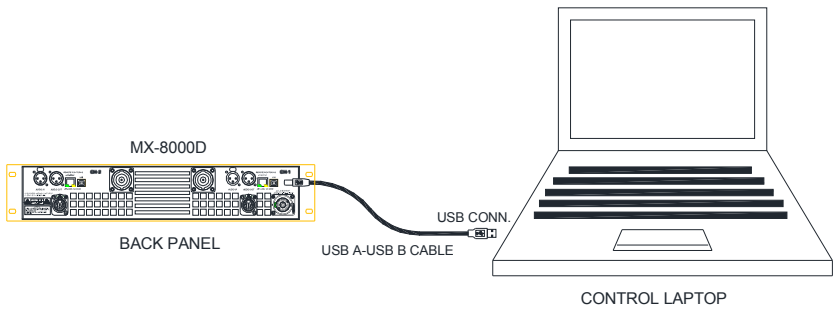
STEP 1

Connect a MX-8000D Amplifier to Control PC using a USB A-USB B (Universal Serial Bus) cable. First time this connection is handled, all necessary drivers for a correct communication between Control PC and Hardware will be installed.

1.- Using a standard USB A – USB B (Universal Serial Bus) cable. In this way, we will use one USB connector of one channel in MX-8000D Back Panel to one of USB Ports in Computer.

Please, note that DCCS will install all necessary drivers for Computer to detect the device and will assign automatically the most convenient COMM Port for a successful communication.

Sometimes will be necessary to switch OFF your MX-8000D amplifier for a correct drivers installation. **This process should only be handled for first time**.



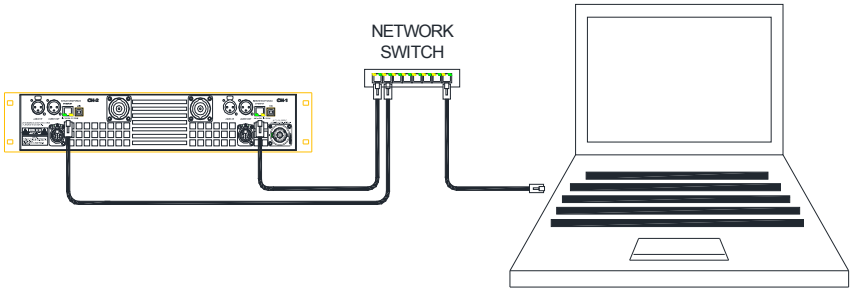
2.- Using a Switch we will need to use for several MX-8000D amplifiers system.

In this case, user will connect an unmanaged 100BaseT network Switch to Ethernet connector in MX-8000D back panel with a standard CAT-5 cable.

Connect the Computer to the Ethernet Switch with another standard CAT-5 cable as shown in figure

From now, we will use from now this second way as it will be the correct way to connect any MX-8000D amplifier system to Control Computer; wired or wireless.

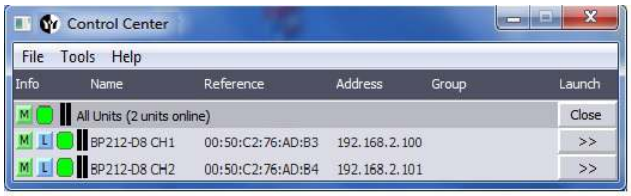
Finally, power up your MX-8000D amplifier.



STEP 2

Launch Musicson Dsp Control Software in Windows or MAC by clicking twice in the icon. Musicson Dsp Control Software will detect automatically, all devices connected in the network. Unit Name indicator will show a GREEN COLOUR besides detected unit if connection is “Active”. If a YELLOW COLOUR appears in Control Center screen, please, check all network connection, configuration and cables: there is a communication problem and you will not be able to use Monitoring and Control Software.

In this case, both MX-8000D channels (CH1 and CH2) will be detected. Main MENU will open Musicson CONTROL CENTER panel in upper-left side of your Computer screen.

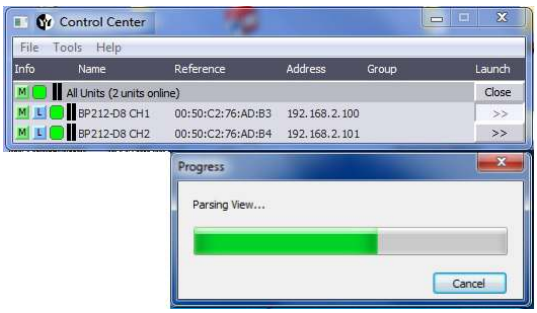

Control Center
File Tools Help
Info Name Reference Address Group Launch
All Units (2 units online) Close
BP212-D8 CH1 00:50:C2:76:AD:B3 192.168.2.100 >>
BP212-D8 CH2 00:50:C2:76:AD:B4 192.168.2.101 >>

1.- **UNIT NAME** : BP212-D8 CH1/CH2. User is allowed to change UNITS NAME through Software.
2.- **REFERENCE** : 00:50:C2:76:AD:B3 y 00:50:C2:76:AD:B4. This is a code ***automatically*** detected. User doesn´t need to introduce
3.- **ADDRESS**: 192.168.2.100 y 192.168.2.101. IP Address for both MX-8000D channels ***automatically*** assigned to networked Units.
4.- **GROUP**: **Not Grouped**. Please, refer to GROUPING Units in this Manual.
5.- **LAUNCH**: Press with mouse over “Double Arrow” to open this unit CONTROL and MONITORING Window

STEP 3. CONTROL AND MONITORING PANELS

Click with mouse over “Double Arrow “ in Musicson CONTROL CENTER to open units CONTROL and MONITORING panel.

Then, 2 new panels will appear in your Control Computer monitor showing progress of Networked Unit PROGRESS together with UNIT CODE, and creating CONTROL AND MONITORING panel views.



After a brief period of time, Musicson Control Center will open Monitoring panel for selected networked unit.

As shown in picture, there is a GREEN indicator in besides **"LINK"**. This mean that communication between networked unit and Control PC is active.

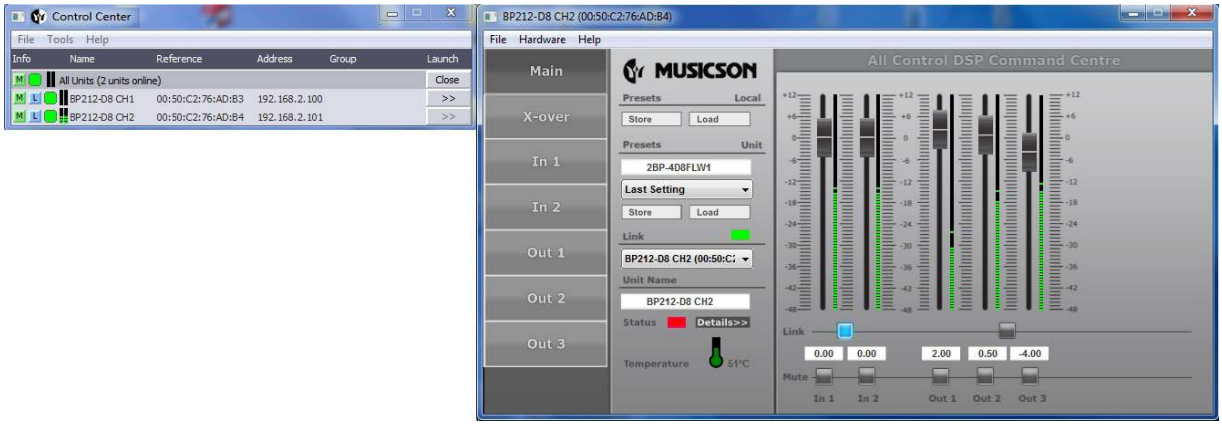
NOTE: If indicator changes to RED color, means that communication is lost. Please, check all network system connections until GREEN color appear again.

Warning!: It is NOT ALLOWED to access to X-OVER, OUT1, OUT2, OUT3 control panels for any changes. This panels contain all information and adjustments for each 3 ways to optimize system including: X-Over and optimization filters, delay, limiting and phase.

STEP 4: MONITORIZING IN/OUT SIGNALS

User will control all INPUT, LOW , MID and HIGH OUTPUT signals by MONITORIZING this signals in opened panel.

Connect a signal source to selected Networked MX-8000D channel and play some music. Signal Levels will appear in Bar-Leds with GREEN Lights



When Levels are High enough that Limiters start to act, **YELLOW** Lights will appear on Bar Leds.

If signal are so high that are distorted, **RED** Lights will appear on Bar Leds.

Note: Peak Signals are displayed on Bar Leds during few seconds. This will help user to fix more convenient Input Level.

Note: Please, note that IN1 and IN2 INPUTS are Linked so, in all cases, Bar leds will display same Level.

Warning!: Never let RED lights appear in any Bar Leds. This may cause important breakdowns either in speakers and power modules

STEP 5: SELECTING FACTORY PRESETS

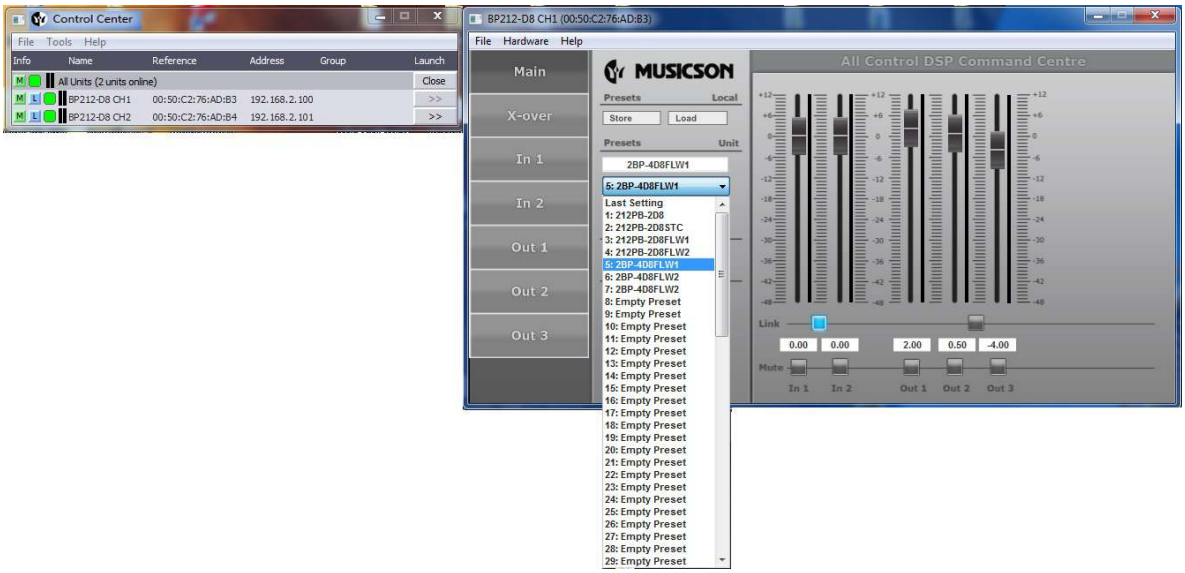
User is allowed in any MX Series Amplifiers Dsp controlled to select most convenient Factory Preset depending on networked system configuration via Musicson Dsp Control Software. All MX Series Amplifiers provide necessary Factory Presets to load on Dsp memory to supply correct signal and outputs to any DSP controlled system.

In this case, MX-8000D amplifier will be supplied with Factory Presets to power next systems:

1.- FALCON-12DA passive system
2.- FALCON-212DA passive system
3.- DOUGLAS-8000 (BP-212 and DOUGLAS-8 Line-array) system.

User will find in this Manual all necessary references for DOUGLAS-8000 system to select most precise Factory Preset

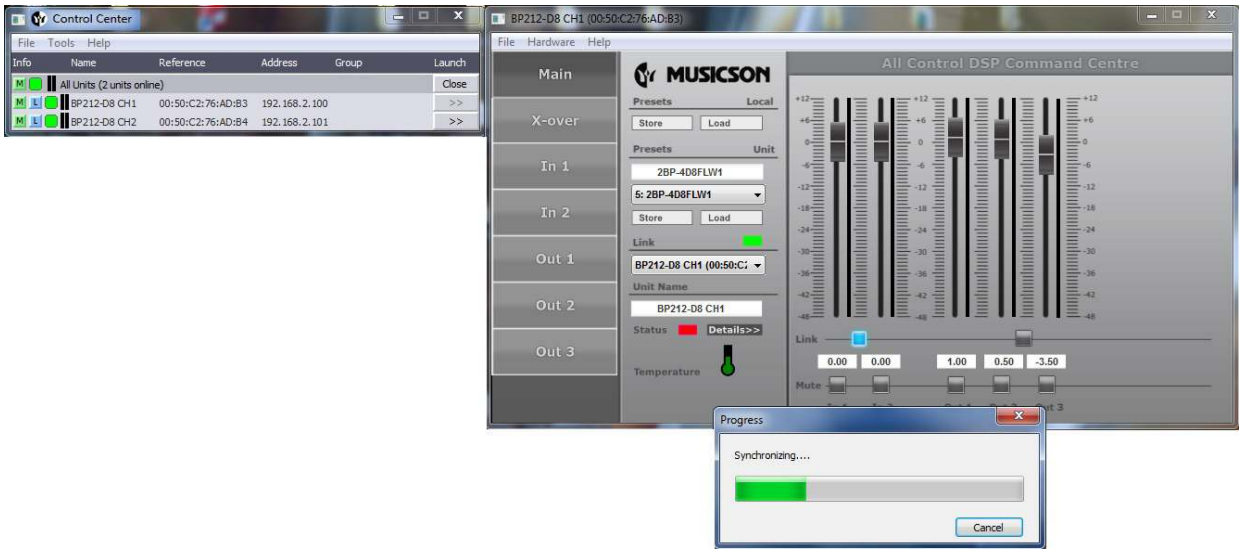
1.- Click with left mouse button on "**PRESETS UNIT**" and selected unit CONTROL panel will open all stored presets



2.- Select most convenient Factory Preset depending on DOUGLAS-8000 system configuration. In this case, for a complete DOUGLAS-8000 flown system, we will have to select **"2BP-4D8FLW1"** Preset. This Preset will contain all necesary adjustments 2 units BP-212 y 4 flown units DOUGLAS-8 each MX-8000D channel.

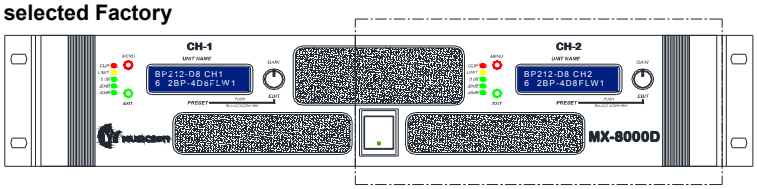
IMPORTANT!: Please; remember your MX-8000D amplifiers features 2 Input DSP modules for each CH1 and CH2 outputs. You should select most convenient Factory Presets in BOTH CHANNELS to have same parameters.

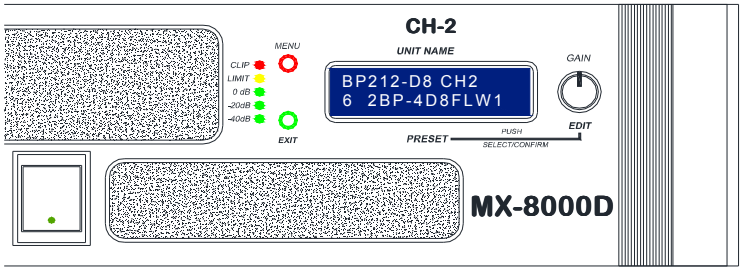
3.- Select now with your mouse **"LOAD"** screen in Section **"*PRESETS UNIT*"** to load this Factory Preset in DSP memory as shown in next figure.



A new panel will appear showing "Synchronization Progress" while software is sending all parameters to DSP memory.

NOTE: As soon as Synchronization Progress finish, selected Factory Preset name will be displayed in both:
- **MX-8000D Front panel display.**
- **PRESET UNIT panel in Musicson Software.**

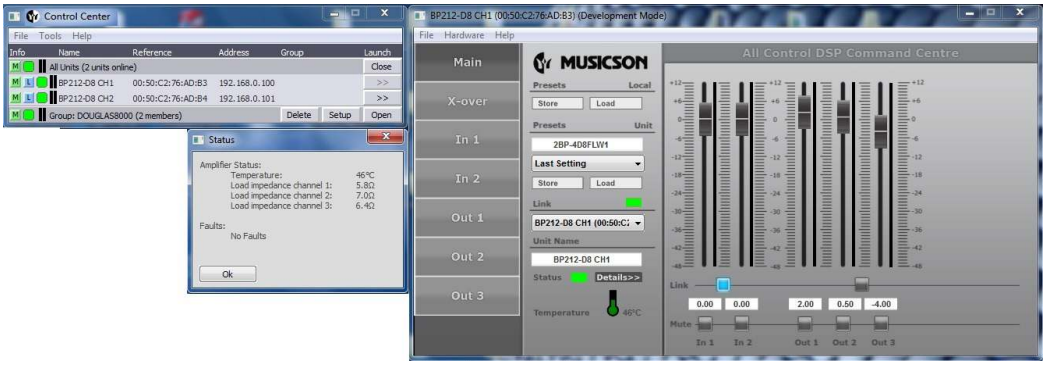




STEP 6: MONITORIZING IMPEDANCE LOADS AND MODULE TEMPERATURE.

Musicson Control DSP Software (from now MDCS) supplied with your MX Series Amplifiers allow also user through some complex algorithms monitorize each output channel LOAD IMPEDANCE as well as Amplifier Temperature.

Each Power Module in MX-8000D amplifier features 4 Thermal Sensors placed in each output channel and also in Switch Mode Power Supply. Musicson DSP Control Software (MDCS) will show this information at any time when “STATUS” led is GREEN. Concerning Amplifier Temperature, Software always display most critical value (highest Temperature)



For both Amplifier channel Temperature and Load Impedance Monitoring, please, select **“Details”** in **“UNIT NAME”** Section as shown in picture.
Please, note that Load Impedance values can give an important information about DOUGLAS-8000 transducers conditions.

STEP 7: CHANGING INPUT GAIN

User can increase or reduce from +12dB to MUTE, INPUT GAIN by 2 methods:

- Clicking on INPUT faders and dragging upwards or downwards or
- Introducing (writing) directly in IN window the desired level value.

IMPORTANT!: Please, try not to use extreme Input Gain values; use 0.0dB as a standard Gain. Please, note that a ±3dB Gain change means twice the acoustic output compared with 0.0dB.

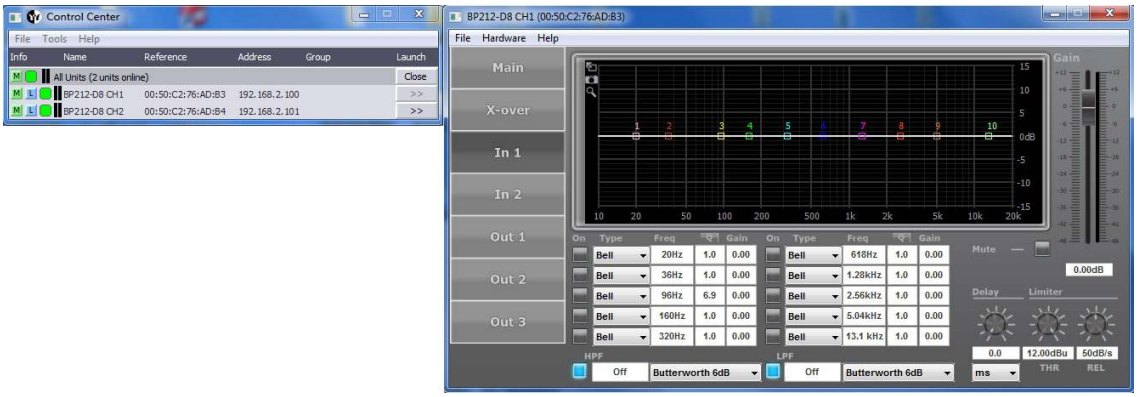
STEP 8: USING INPUT EQUALIZATION FILTERS

As previously commented, MDCS supplied with MX Series Amplifiers allow:

1.- Input/Outputs Signals Monitoring (refer to previous Manual Sections)
2.- Input parameters Control: X-Over and Optimization filters, Delay, Limiters and Compressors.

Although Factory Presets makes DOUGLAS-8000 system to deliver high Output Levels with a Flat Frequency Response by selecting most convenient one, in some cases, audience area features (buildings, trees, walls,…) makes some “ Equalization corrections” necessary in units to avoid undesirable effects..

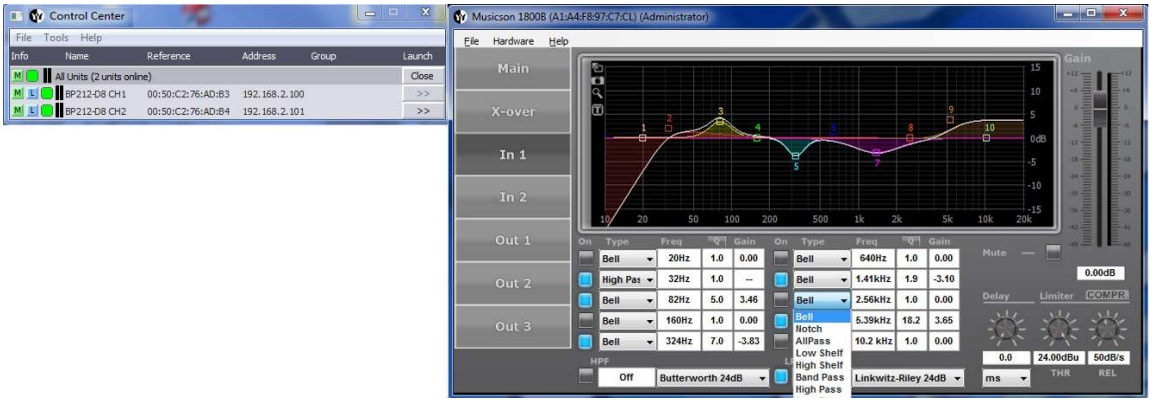
1.- Tap with mousse button over **IN1** panel in MDCS. Control panel will appear in Control Computer screen:



MDCS features up to 10 Optimization filters (including X-Over Low-Pass and High-Pass) in each MX Series Channel. Available filters types are:

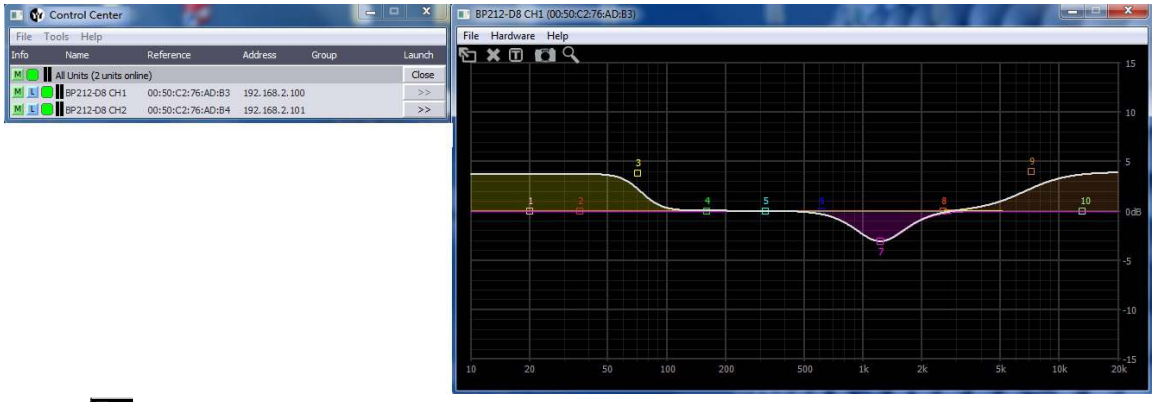
- **BELL** : Selectable in any Frequency with variable Q (0.2 to 20), and Gain (between -12 and +12dB)
- **NOTCH** : Selectable in any Frequency with fixed Q=10 and G=-40dB
- **ALLPASS**: Selectable in any Frequency with variable Q (1 to 25)
- **LOW-SHELF**: Selectable in any Frequency with variable Q (3 to 25) and Gain (between -12dB to +12dB)
- **HIGH-SHELF**: Selectable in any Frequency with variable Q (3 to 25) and Gain (between -12dB to +12dB)
- **BAND-PASS** : Selectable in any Frequency with variable Q (0.2 to 25)
- **HIGH-PASS** : Selectable in any Frequency with variable Q (0.5 to 2)
- **LOW-PASS** : Selectable in any Frequency with variable Q (0.5 to 2)

2.- User can use either Equalization panel to configure necessary EQ. filters or clicking with mouse over each point in GRAPH and dragging with left button of mouse pressed to select Filter Frequency center and Gain.

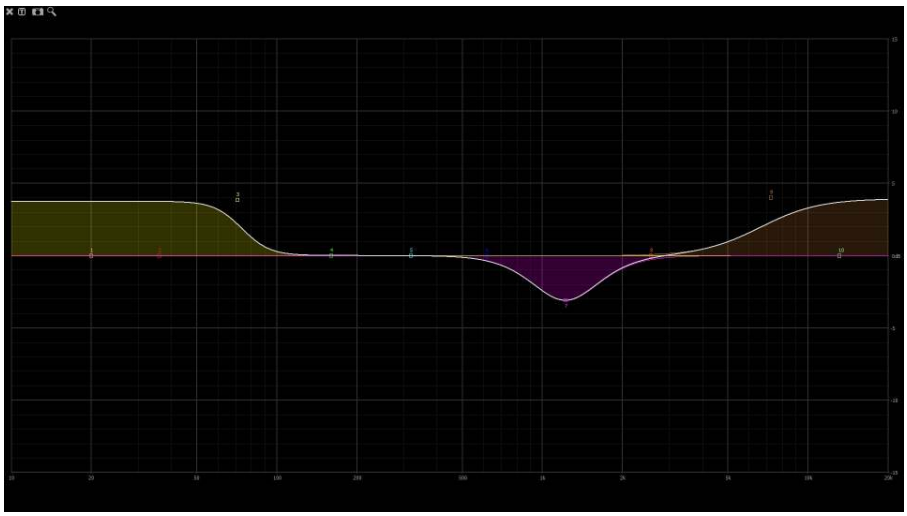


It´s possible to use PC mouse to adjust all EQ. filter parameters.
Tap with PC mouse LEFT button over desired EQ. filter number (square symbol) and, while holding on, move it upwards (increase Gain) or downwards (reduce Gain).
Tap with PC mouse RIGHT button over EQ. filter number (square symbol) and, while holding on, move it to the right (increase Q with narrower .filter bandwidth) or left (reduce Q with wider filter bandwidth).
User is allowed to switch Equalization filters ON and OFF in Real-time to check sound differences in order to make filters best choice by tapping over blue square besides EQ filter: Blue color means EQ filter ON and no color means EQ filter OFF.
Size of Graphs can be increased for a more accurate data display by selecting in Left Upper side on screen. There are 2 screen size levels:

1.- First size level as shown in next figure

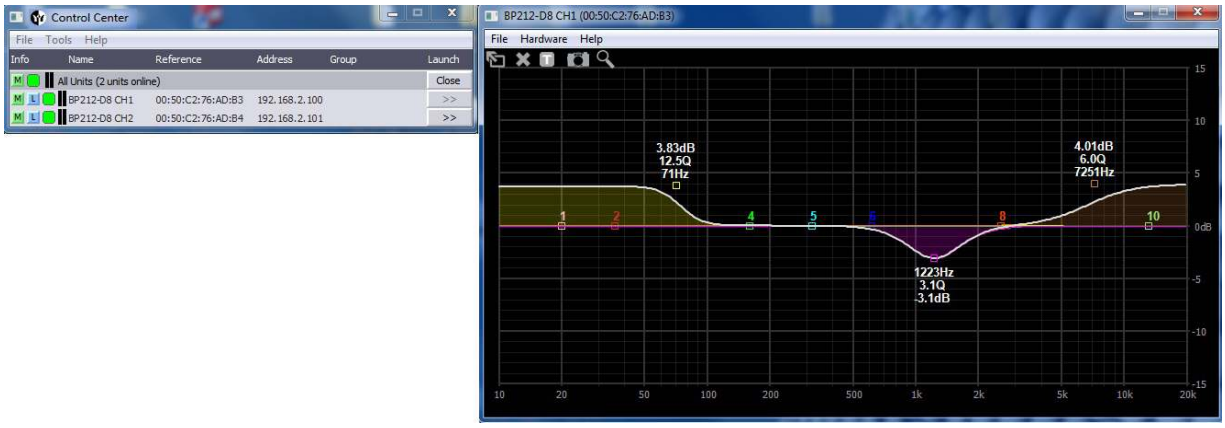


2.- Select again to have a full Control PC screen Graph.



Select **X** screen will return to standard size.

Select to display on each EQ filter all adjusted parameters such as Frequency Center, Q and Gain.



User is allowed also to “Save” or “Print” adjustments information in a Graphical Format file (.PNG) by tapping .

An especific bandwidth can be displayed using “Zoom” option by tapping .

Warning!: Please, do not attempt to use extreme or radical EQ. filters Gain. It could deteriorate system performance and quality Please, note that this kind of adjustments should be used only as a audience areas features corrections like trees, buildings, walls,… Remember your MX-8000D amplifier will deliver all necessary output corrections for an optimized system performance selecting most adequate Factory Preset.

STEP 9: USING INPUT DELAY AND SIGNAL LIMITER

1.- Input Signal can be delayed for time corrections in delay lines by entering most adequate value in “**DELAY”** screen in Control panel. By default, Input signal delay is **0.00ms.** Maximum Input Delay value will be **800ms** that means **275 meters**.
For an easier Delay adjustment, user can switch units between milliseconds, seconds, meters, feet,…

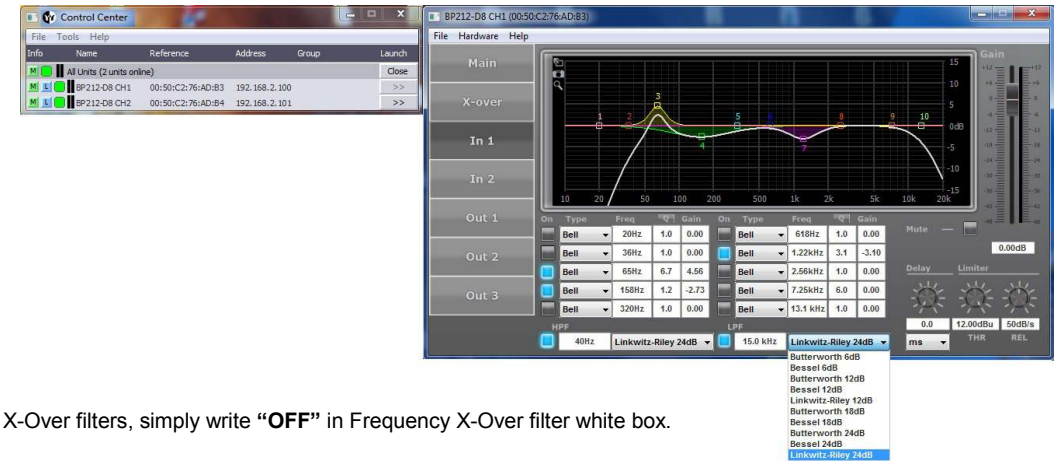
2.- Maximum Input Signal can be also Limited entering value on “**LIMITER THR”** screen to limit in that each 3 way máximum output power. Limiter Release can be changed in “**LIMITER REL”** screen. By default, **+12.00dBU**.is minimum Input Signal Limiter that means each 3 way maximum output power.

STEP 10: USING INPUT HIGH-PASS/LOW-PASS FILTER

Maybe, in some cases, could be useful to apply Input Signal X-Over filters.

Input High-Pass and Low-Pass X-Over filters (Butterworth, Bessel and Linkwitz-Riley types) are availble to user with slopes between 6 and 24dB/Oct in Control Panel.

User can easily switch X-Over filters ON and OFF by tapping over blue square: blue color means filter ON and no color means filter OFF.



To remove X-Over filters, simply write **“OFF”** in Frequency X-Over filter white box.

13.-GROUPING FUNCTIONS

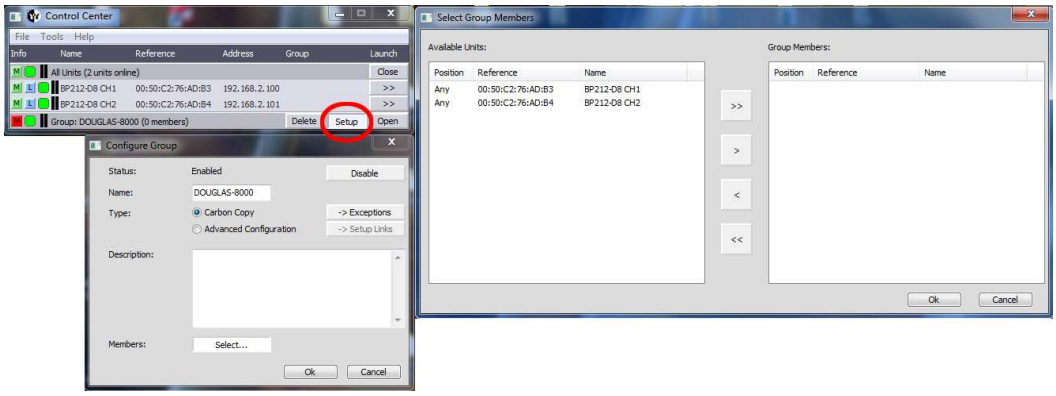
Working with large number of systems, **GROUPING** function allows user the possibility to make convenient Groups of MX Series Amplifier Control Parameters copying from one “master” to rest of “Slave” channels same Input configuration and adjustments. This function avoid user to enter in all individual DSP same adjustments to manually configure them.

NOTE!: Musicson Dsp Control Software allows user to select NOT TO GROUP certain parameters to have individual control even inside a configured GROUP.

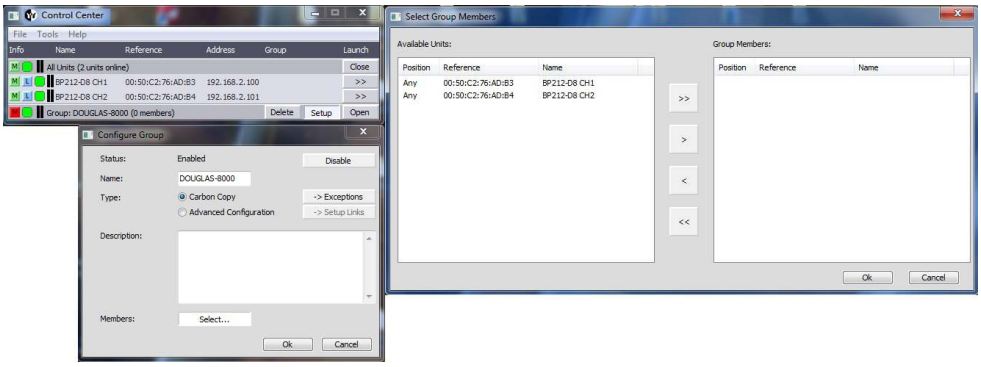
1.- Tap over **“TOOLS”** in Musicson **Control Center** panel Menu.
2.- Select **“NEW GROUP”** option and then write a convenient GROUP NAME. Confirm with **OK.**
3.- Follow this 2 simple steps to create as number of GROUPS as needed.

In this example, a GROUP will be configured with MX-8000D amplifier CH1 and CH2 called **“DOUGLAS-8000”**

3.1.- Select networked units to join in selected GROUP **“DOUGLAS-8000”** by tapping in **“SETUP”** window as shown in figure. A panel **“Configure Group”** will be opened

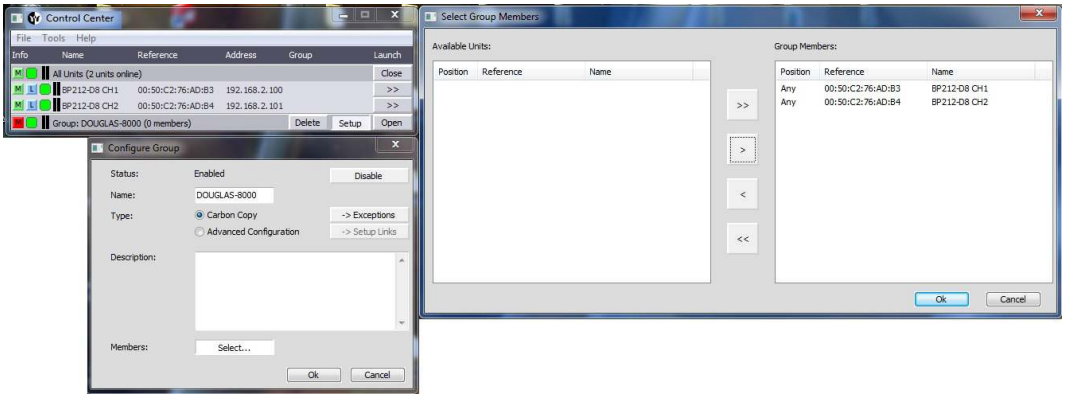


Tap on **“Select…”** window and **“Select Group Members”** menu will be opened with all networked units as shown in next figure



In this case, both MX-8000D channels (BP212-D8 CH1 and BP212-D8 CH2) will be selected to join in **“DOUGLAS-8000”** Group by tapping in each of them in **“Name”** column and also in single arrow **“>”** to be added to Group.

Please follow this steps to add units to selected GROUP one by one. Both **“Members”** will automatically sent to **“Group Members”** screen.



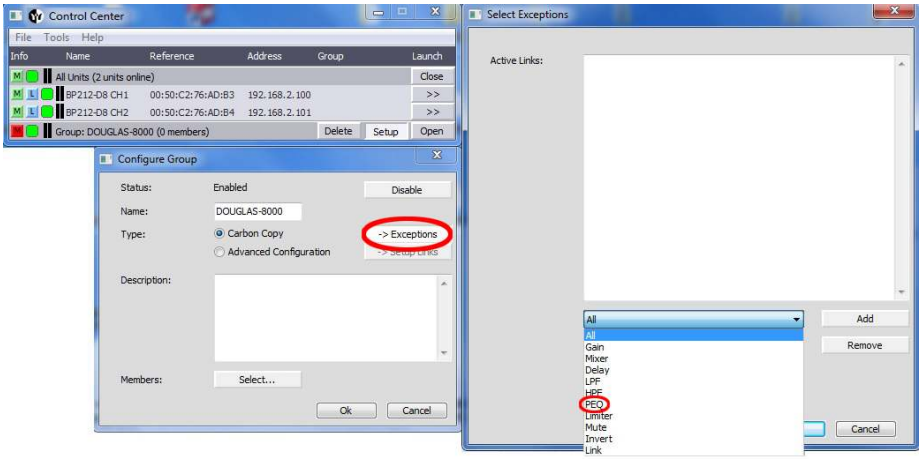
Finally, tap **“OK”** when all Members Group have been selected. “Select Group Members” screen will close.

4.2.- Parameters that should **NOT BE GROUPED**

Musicson Dsp Control Software allows **NOT TO GROUP** parameters inside a configured GROUP to have individual members control over them.

This feature is specially important when it is necessary to control EQ. Filters, Input Delay, Input Gain, Limiting,… or any other control parameters individually in members inside same GROUP.

To configure “ungrouped” parameters tap **“→Exceptions”** window in “Configure Group” screen.



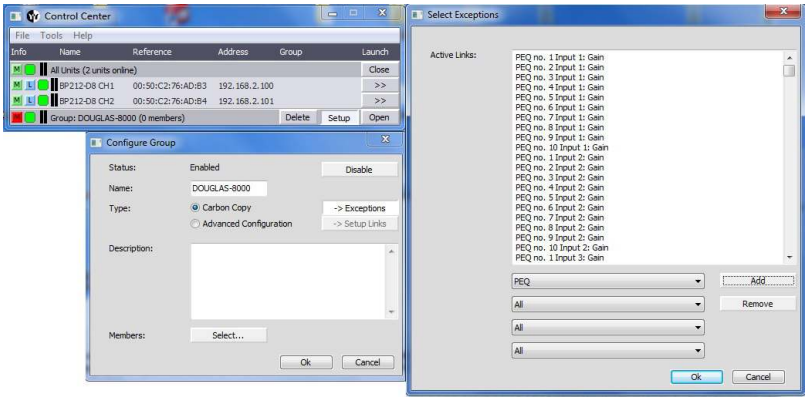
In this example, we will “ungroup” EQ. Filters **PEQ** in configured DOUGLAS-8000 GROUP. After **“→Exceptions”** is selected, user will be requested to select exception through “**Select Exceptions”** Menu screen as shown in figure. Tap **“All”** and select which parameter would you like to “ungroup” to have individual control. In this case EQ. Filters **PEQ.**

Finally Select **“OK”**.

Figure will show the process while MDCS is **“ungrouping”** all Input PEQ filters inside DOUGLAS-8000 Group.

If any other parameter should be “ungrouped”, please, follow same steps using consecutively **“All”** popup menu.

IMPORTANT!: Please, note that all adjustments and configurations made in Input DSP´s, will remain in memory each time MX-8000D amplifier will switch ON again. Check before using your system, all configuration loaded.

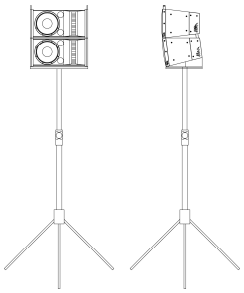


14.- FACTORY PRESET SELECTION DEPENDING ON DOUGLAS-8000 SYSTEM CONFIGURATION

Both Musicson Software and front panel display controls allow user to select most convenient Factory Presets depending on DOUGLAS-8000 system configuration.

Please, follow next guide to select Factory Presets to deliver highest performance with your DOUGLAS-8000 system:

PRESET 1: STND-ALONE

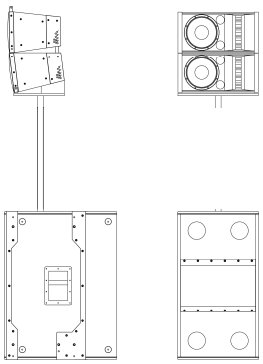


Use this Factory Preset in case only Line-array elements are needed without BP-212 Subs. Please, refere to figure in next situations:

“STAND ALONE” or Douglas-8 over stands without BP-212, “FRONT-FIELD” , or “SIDE-FIELD”

Please, be advised that Douglas-8 line-array was designed to be used with BP-212 Subs. User should be specially careful in this situation due to Douglas-8 low frequency response limitations.

PRESET 2 : 1BP-2D8 STK1

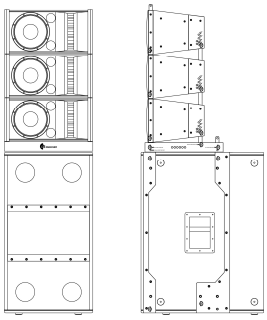


Please, select this Factory Preset in case that DOUGLAS-8000 system is configured as shown in figure.

Factory Preset is valid for any Douglas-8 splay angles selected.

Factory Preset is also valid if 2 or 3 Douglas-8 line-array elements are used.

PRESET 3 : 1BP-2D8 STK2

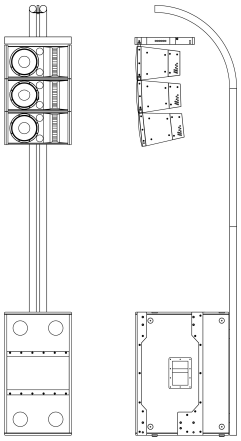


Use this factory Preset in case of Douglas-8000 system with 2 or 3 line-array elements “STACKED” over 1 BP-212 subwoofer system.

Factory Preset is valid for both 2 or 3 line-array elements used.

Factory Preset is also valid in cases where upper line-array should be configured for balcony in which splay angles will be increased.

PRESET 4 : 1BP-2D8 FLW

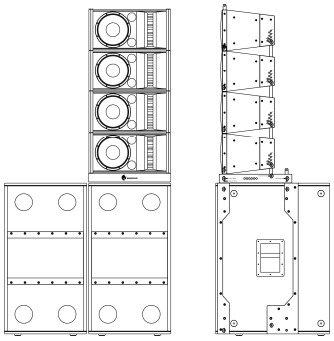


Use this factory Preset in case of Douglas-8000 system with 2 or 3 line-array elements “FLOWN” over 1 BP-212 subwoofer system using our light-weight aluminum Douglas-8000 tower.

Factory Preset will be valid for either 2 or 3 line-array elements.

Advice: For a correct audience coverage, please select always splay angles between 0º and 3º in Douglas-8 line-array elements as shown in figure.

PRESET 5 : 2BP-4D8 STC

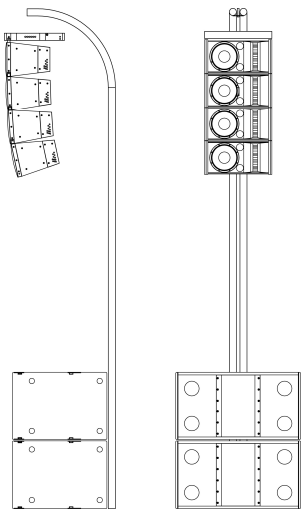


Use this factory Preset in case of Douglas-8000 system with line-array elements “STACKED” over 2 BP-212 subwoofer system.

Factory Preset will be valid in case 3 or more (**up to a maximum of 5**) Douglas-8 line-array stacked elements are used.

Preset will also be valid in cases where upper line-array should be configured for balcony in which splay angles will be increased.

PRESET 6 : 2BP-4D8 FLW1



Douglas-8000 system configuration “FLOWN1”. Using 2 BP-212 subs and, 3 up to a maximum of 5 line-array Douglas-8 units each MX-8000D amplifier channel

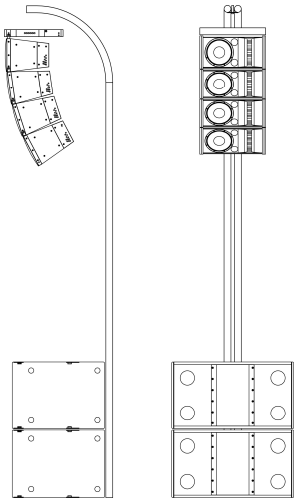
For an optimized audience coverage, Musicson highly recommend a typical “J” Doulglas-8 line-array configuration.

There are 2 possible splay angles selection for this kind of line-array configuration:

1.- **0º, 1º, 3º, 5º** splay angles between Douglas-8 for Long-Throw.
2.- **0º, 2º, 4º, 8º** splay angles for an improved vertical coverage.

ATENTION!: Musicson highly recommend to DOUGLAS-8000 system to use this line-array splay angles configuration with this Factory Preset to optimize and Frequency Response and audience area coverage.

PRESET 7 : 2BP-4D8 FLW2



Douglas-8000 system configuration “FLOWN2”. Using 2 BP-212 subs and, 3 up to a maximum of 5 line-array Douglas-8 units each MX-8000D amplifier channel

Use this Factory Preset in case of small to very small (up to 15 meters long) audience áreas as well as in cases where Douglas-8000 system should be placed over an stage or over a relatively high elevated platform.

To handle this Douglas-8000 configuration, user should select quite “closed” line-array splay angles:

1.- **0º, 4º, 8º, 12º** Douglas-8 splay angles for Long-Throw.
2.- **0º, 5º, 10º, 14º** Douglas-8 splay angles for improved vertical coverge.

15.- DOUGLAS-8000 RIGGING SYSTEM

Safety is the most important issue when suspending heavy-weight loads such as a Professional Sound System like DOUGLAS-8000, especially when it´s hanging above heads of personnel; professional or not.

A deficient suspension and rigging techniques, the use of non-original DOUGLAS-8000 rigging parts, even a non appropriate equipment may cause serious legal issues related to property damages or personal injury.

Never think all secure measures are too much: read or assist to Hoist manufacturers seminars, and consult every aspect of this business with your Insurance Company.

Follow all rules and advices provided by your trussing system (or any other suspension system) manufacturer and be sure that your structure can meet with weight requirements.

Finally, please be sure to understand and follow any Local Safety Regulations; you must strictly follow all Security Load Factors prescribed by Authorities.

15.1.- RIGGING SYSTEM OVERVIEW

Rigging system in DOUGLAS-8000 is completely integrated in both cabinets: Douglas-8 Line-array element as well as BP-212 subwoofer.
User can configure DOUGLAS-8000 system in many ways (Refer to Configurations in this Manual) flying BP-212 together Douglas-8 or placing BP-212 on the floor and flying Douglas-8 line-array elements.
To configure DOUGLAS-8000 in both ways, Musicson has developed only one Frame model in order to make easier the system flying tasks, reducing also number of optional rigging pieces.

Douglas-8 rear rigging detail

BP-212 upper side rigging detail

BP-212 lower side rigging detail

As shown in both BP-212 subwoofer rigging plates figures, there are 4 rigging points in cabinet upper side to fix flying Frame. There are also in lower side, 2 rigging points market with 1 and 2 in figure for:
1.- Line-array Douglas-8 fixing point when suspending under BP-212.
2.- Second BP-212 subwoofer fixing point for suspending 2 BP-212 units.

15.2.- OPTIONAL ACCESSORIES

15.2.1.- ELEVATION FRAME

Musicson has developed only 1 Elevation Frame model to ¨fly" both BP-212 subwoofer and Douglas-8 line-array. Frame will also be used when Douglas-8 should be "stacked" over BP-212 Sub.
Frame is made of 60 x 10mm thickness platen steel and 3mm iron plates to ensure necessary strength for flying a complete BP-212 and Douglas-8 elevation.
Douglas-8000 system Frame has been developed to handle up to 15 Douglas-8 Line-array elements as well as 2 BP-212 together 5 units Douglas-8.

15.2.2.- ELEVATION STAND

Specially designed to use in DOUGLAS-8000 system. It can be assembled in both upper and one lateral sides of BP-212 subwoofer, to use a máximum of 3 line-array Douglas-8 cabinets.
Stand features 3 height points which may be secured by a supplied lock pin.
Douglas-8 will be assembled to stand through a dedicated wooden platform.

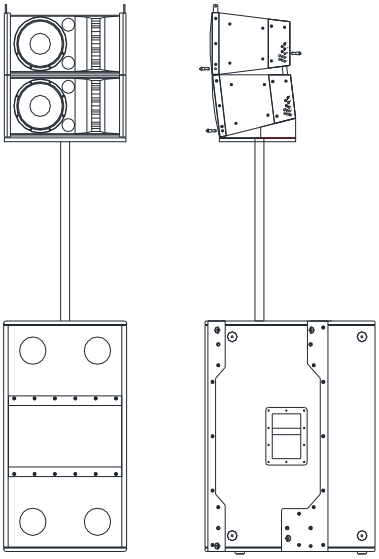
3 Position Douglas-8000 cabinet stand

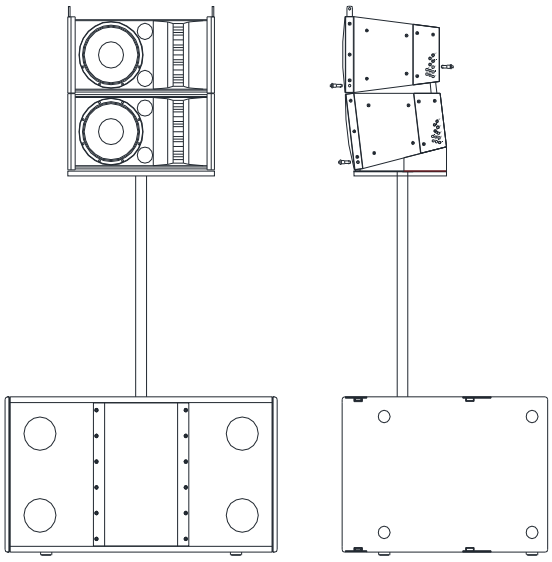
Wooden Platform

Douglas-8000 assembled stand

BP-212 subwoofer cabinet features 4 M-8 points in both upper and lateral sides to assemble Douglas-8000 stand.

Please, use BP-212 lateral fixing points in cases Douglas-8000 system should be assembled in higher positions such as over stages or platforms.





In both cases:

1.- Unscrew 4 Allen M-8 placed in upper or lateral BP-212 side.
2.- Fix Douglas-8000 system stand over selected BP-212 side using 4 handled M-8 screws.
3.- Assemble Douglas-8 line-array elements to wooden platform using its double ball quick-lock pins using most adequate splay angles as you can see in figure.

15.2.3.- DOUGLAS-8000 TOWER

Especially designed for DOUGLAS-8000 system. It can be assembled over BP-212 rear side to “fly” Douglas-8 line-array elements or over a dedicated base with wheels, balanced system and reinforcement pieces.

Made of 2 2mm thickness tubes, Douglas-8000 tower can handle up to 5 Line-array elements Douglas-8 when it´s assembled on BP-212 rear side to fly system to 4 meters high or up to 10 units when base, balanced system and reinforcement pieces are used. Tower has been designed with different 1.5m height sections and a curved one at the end.

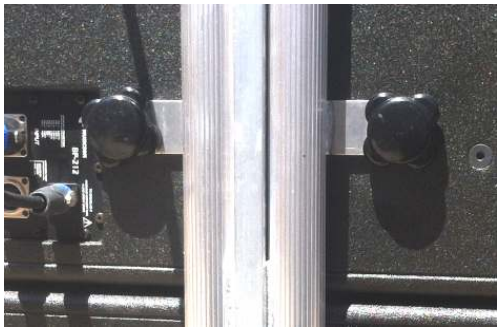
1.- One 1.5 meter length section containing BP-212 subwoofer fixation plates through 4 handled M-10 screws as well as a 150Kg winch.

2.- One 1.5 meter length section as an extension

3.- One curved section to raise Douglas-8 line-array to finally output time correction with BP-212 Subs.

4.- There is an specially designed Douglas-8000 system Tower Base with Secure systems including wheels, balanced system and reinforcements piece to handle up to 10 Douglas-8 line-array elements. Together with a 1 meter length section to “fly” Douglas-8 line-array up to 5 meters height.

All Douglas-8000 Tower sections will be easily and quick fixed with conical aluminum pieces and secured by quick pins.



Douglas-8000 Tower fixing points to BP-212 Subwoofer Details

DOUGLAS-8000 TOWER ASSEMBLY

Optional DOUGLAS-8000 Tower can be assembled in different ways depending on system configuration. Using up to 5 Douglas-8 line-array elements per channel, it can be assembled directly over BP-212 Subwoofer rear sides. Using up to 10 line-array elements each channel, other optional pieces should be assembled in Douglas-8000 Tower: Base with wheels, balanced system and reinforcement piece. There is also a 1 meter length section to raise Douglas-8 line-array elements up to 5 meters height.

Basic Douglas-8000 Tower has 3 sections:

2 Straight 1.5 meters lenght sections

Section Nº1

Section Nº2

1 upper curved section

All necessary security pins are supplied for a secured assembly tasks.

1. Assemble all 3 Douglas-8000 Tower Sections by matching Male/Female both ends conical pieces. Secure them by using 2 supplied conical pins each side. Use, if necessary, a nylon hammer to fix security pins in its right position..

2. Rotate winch handle placed in Section Nº1 to have Steel cable out winch. Please, be sure to have enough cable length to avoid system assembly. As a general rule, place out of winch a double length of Douglas-8000 Tower,that means around 8 meters.

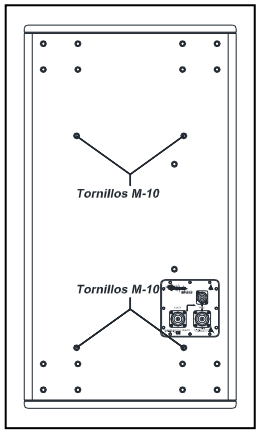
3. Turn 3 metal pieces placed in upper curved section to insert Steel cable inside 3 pulleys between 2 aluminum tubes. Once inserted, please, close 3 pieces again and fixed in its right position using M-4 screws. In that way, Steel cable will be guided always inside pulleys.

   Please, refer to next figure:

4. Douglas-8000 Tower will be assembled and ready to be fixed over BP-212 rear side.

1.- DOUGLAS-8000 TOWER ASSEMBLED ON 1 BP-212

In this case, we will fix assembled Douglas-8000 Tower over ONE BP-212 subwoofer rear side in vertical position.

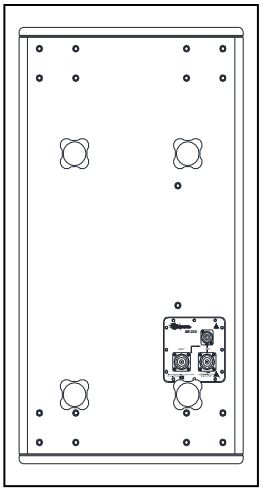


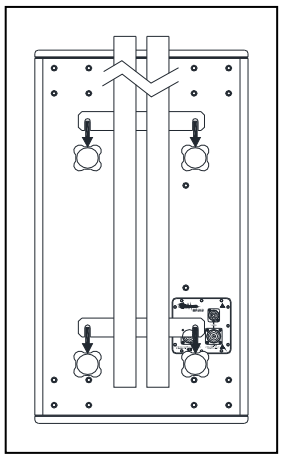
Please, assemble Douglas-8000 Tower first as described in previous point.

There are 6 Allen M-10 screws fixed on BP-212 rear side.

Please, proceed to unscrew 4 marked M-10 screws in left side figure and use in its place 4 M-10 screwed handles supplied with your Douglas-8000 Tower as shown in right side drawing.

To facilitate both aluminum machined platen assembly and fixation through screwed handles, please be sure to leave around 15mm threaded shaft out of wooden BP-212 box.

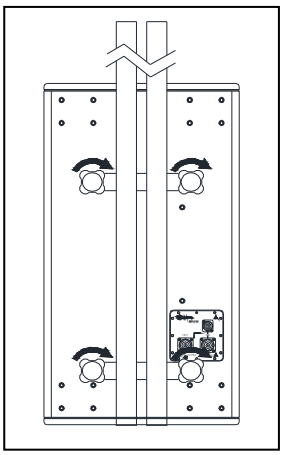


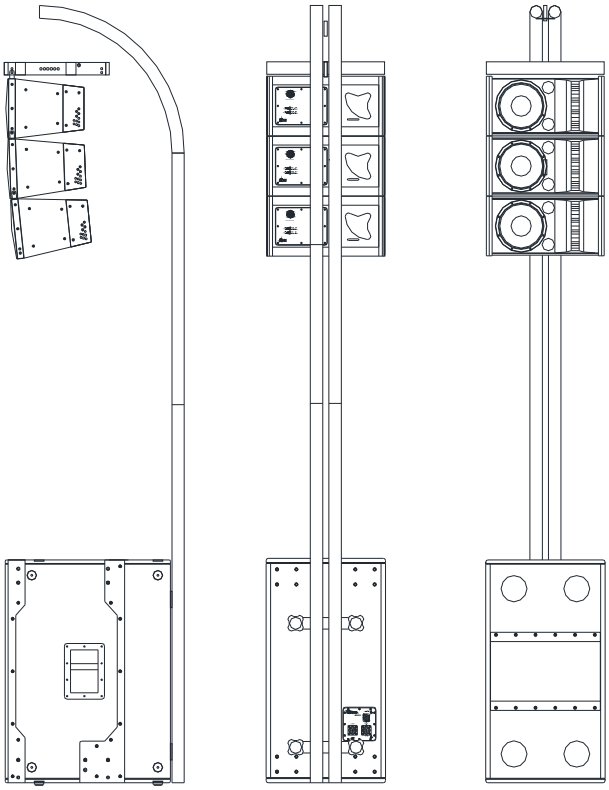


Drop very carefully Douglas-8000 Tower matching platen clefts with M-10 Threaded shafts as you can see in next drawing.

Finally, secure Douglas-800 Tower to BP-212 subwoofer by strongly screwing 4 M-10 rear handled screws.

Warning!: Do NOT attempt to configure this kind of assembly using more than 3 flown Douglas-8 Line-array elements. System Stability will be under mínimum requirements and may cause serious injuries.

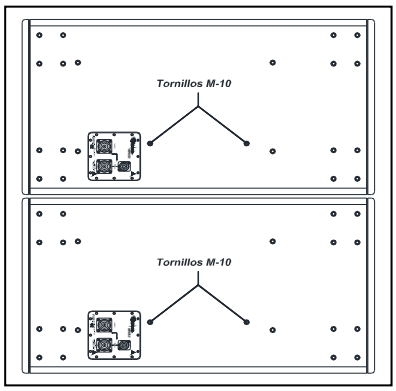




2.- DOUGLAS-8000 TOWER ASSEMBLED OVER 2 BP-212

In this case, Douglas-8000 Tower will be assembled over 2 BP-212 subwoofer rear sides in Horizontal Position.

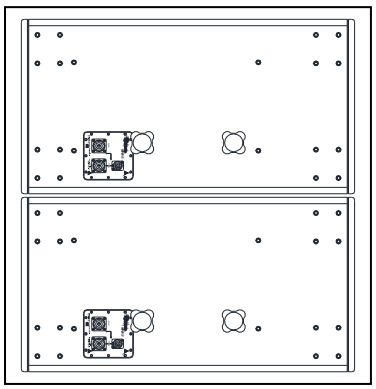
1.- Please, assemble Douglas-8000 Tower first.

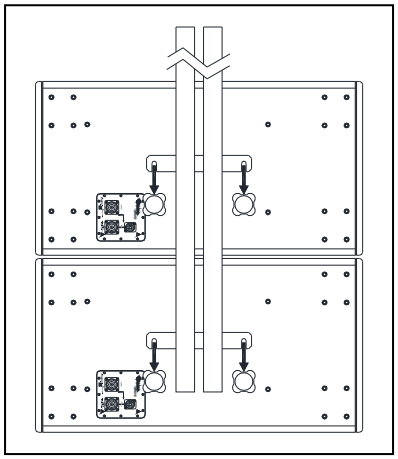


2.-Unscrew 2 M-10 Allen screws in each BP-212 subwoofer rear sides as shown in left drawing.

3.-Place 4 handled M-10 screwed handles in this 4 points as shown in right drawing.

To facilitate both aluminum machined platen assembly and fixation through screwed handles, please be sure to leave around 15mm threaded shaft out of both BP-212 boxes.

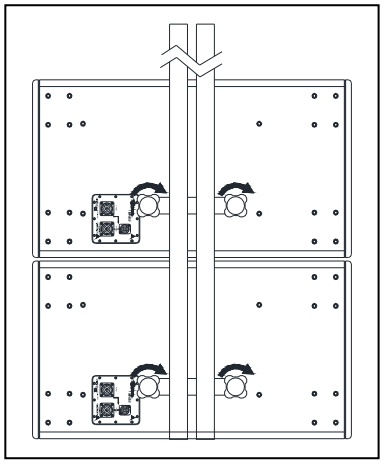


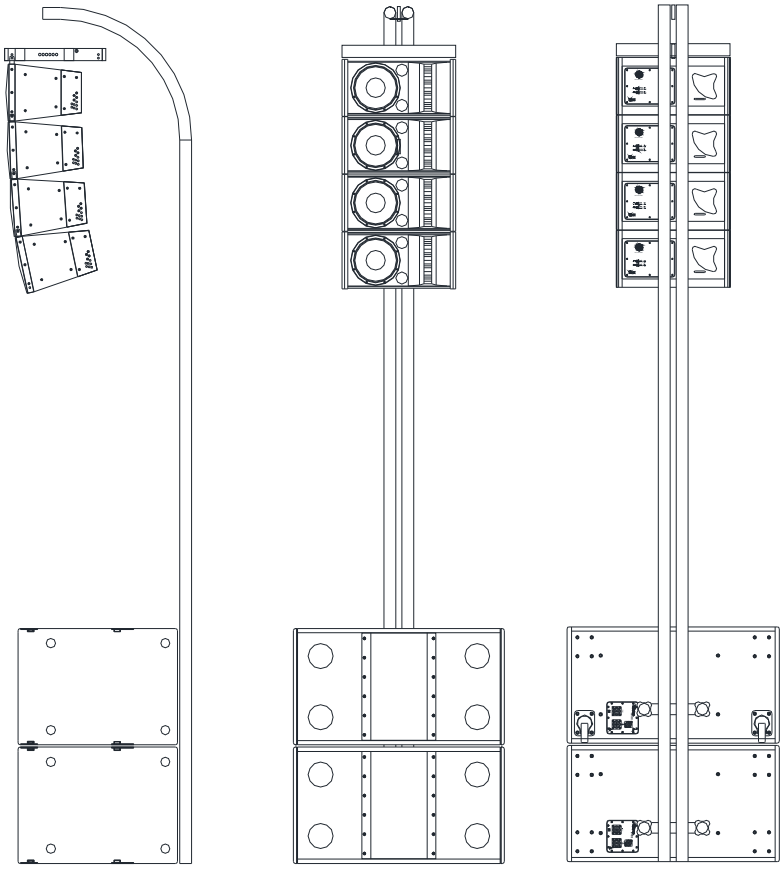


4.- Drop very carefully Douglas-8000 Tower matching platen clefts with M-10 Threaded shafts as you can see in next drawing

5.- Finally, secure Douglas-800 Tower to BP-212 subwoofer by strongly screwing 4 M-10 rear handled screws.

Warning!: Do NOT attempt to configure this kind of assembly using more than 5 flown Douglas-8 Line-array elements. System Stability will be under minimum requirements and may cause serious injuries.





15.2.4.- GRAZIER

Musicson will supply as an option a specially designed GRAZIER for Douglas-8 line-array cabinets to avoid assembled system rotation once "flown" with Douglas-8000 Tower.

Grazier is made of several iron pieces:

- One central U-shaped piece.
- One rear U-sheped piece to fix line-array system to Douglas-8000 Tower Section. This rear piece will be fixed to central body by using 2 double ball security quick-lock pins.
- 2 Perforated iron plates to fix last Douglas-8 Line-array selecting most convenient holes keep system angle as well as distance from Tower sections.
- 8 Diameter 8mm security double ball quick-lock pins.

Grazier will be assembled once Douglas-8 line-array system is splay angles between boxes already configured and securely fixed with elevation frame in Tower.

To assemble grazier, please raise Douglas-8 Line-array system first above both straight Tower Sections junction.

Then, Fix both perforated iron plates to last Douglas-8 line-array element both sides by using 2 security double ball quick-lock pins (in both cabinet sides) selecting **0º y 2º** splay angles as shown in figure.

Enter central U-shaped piece in both sides perforated plates and select most convenient holes to keep right line-array system angle and separation from Tower using quick-lock pins. Please, refer to figure for a secure and efective grazier assembly.

Finally, enter rear U-shaped piece with rubber between Tower section and grazier to securely fix Doglas-8 line-array system. Use 2 diameter 8mm double ball security quick-lock pins to fix this rear piece to assembled grazier. Please, be sure that U-shaped piece is placed ABOVE tower secure pins as shown in picture

.

15.2.5.- DOUGLAS-8000 BASE WITH WHEELS

There is also a base with wheels as an option to Douglas-8000 Tower. This base is very small and light-weight compared with many other: it´s only 90cmx70cm and 80cm height for an easier transport and assembly. Douglas-8000 Tower base features 5 balanced points through rounded metal pieces to secure Tower assembly in not completely flat floors as well as a reinforcement aluminum upper plate to “fly” more than 5 Douglas-8 cabinet up to a maximum of 10 units. There is also available a 1 meter height extension Section to “fly” system up to 5 meters high.

DOUGLAS-8000 Tower base with wheels.

Douglas-8000 Tower base with balanced system and Sections

15.3.- DOUGLAS-8000 STACKED SYSTEM ASSEMBLY

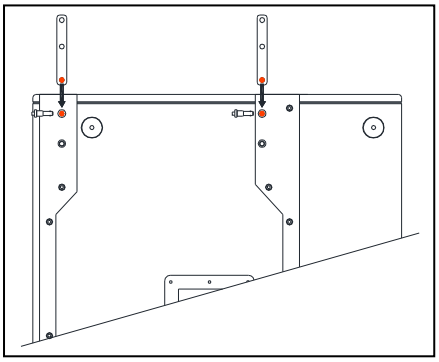
Douglas-8000 Elevation Frame allows user to assemble “STACKED” Douglas-8 line-array elements over BP-212 subwoofer as shown in figure.

To configure a STACKED system, there are 4 specially designed perforated iron plates that may securely be fixed at the same time in Elevation frame and in upper side of BP-212 subwoofer as well as also in first Douglas-8 line-array element.

Iron rigging pieces will also be used to “fly” BP-212 subwoofer using Douglas-8000 Elevation Frame.

Please, follow next steps for a secure Douglas-8000 STACKED assembly over BP-212 subs:

1.- Fix perforated iron plates into BP-212 rigging tubes using 2 quick-lock pins each side as shown in drawing.

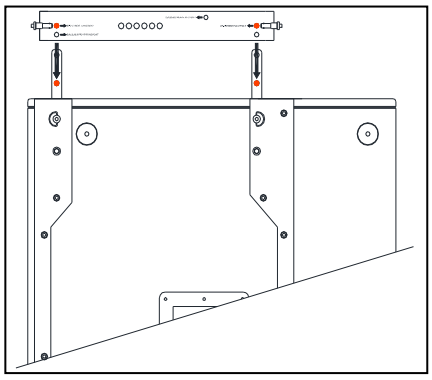


User will need 4 double ball quick-lock pins: 2 for frontal pieces and 2 for rear pieces.

Figure shows correct fixing points as well as rigging plates position.

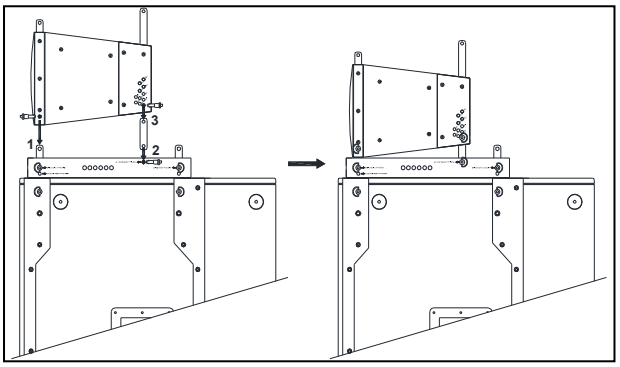
2.- Place Douglas-8000 Elevation Frame in upper side of BP-212 subwoofer. Please, be sure to insert 4 rigging plates inside Elevation Frame grooves.

Use 4 double-ball quick-lock pins to securely fix Frame to BP-212.



3.- Fix optional rear rigging piece with a security quick-lock pin (marked with **2** in drawing) in Elevation Frame. Please, be sure to select correct holes for this purpose. Please, refer to drawing.

4.- Place first stacked line-array Douglas-8 over Elevation Frame.



Please, be carefull when inserting front and rear frame rigging plates inside Douglas-8 line-array matching pieces in it´s right positions:

2 front rigging plates (marked with **1** in drawing) previously fixed in BP-212 subwoofer. Secure frontal rigging plates with 2 quick-lock pins in both sides.

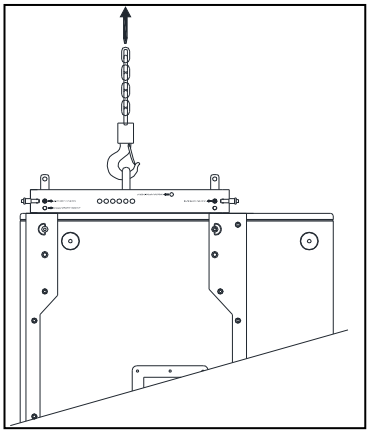
2 rear rigging plates (market with **3** in drawing) previously fixed in Elevation Frame. This pieces should be placed between 2 metal rigging plates in Douglas-8 line-array. Please, select **0º** splay angle to stack first line-array element with 2 quick-lock pins.

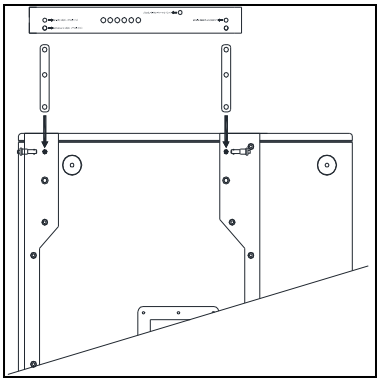
15.4.- DOUGLAS-8000 ELEVATION SYSTEM

User may use also Douglas-8000 Elevation Frame to “fly” complete Douglas-8000 system including BP-212 subwoofers using a stronger Tower by placing first BP-212 units and Douglas-8 line-array elements below Subs. Rigging system is included in BP-212.

Please , follow next steps to “fly” a complete Douglas-8000 system:

1.- Fix perforated iron plates into BP-212 rigging tubes using 2 quick-lock pins each side as shown in drawing: 2 front and 2 rear rigging pieces. Both are identical, so you don´t need to look for front or rear pieces. First steps should be same as previous chapter.





Use 4 optional quick-lock pins as shown in drawing to fix them in BP-212 rigging holes.

2.- Place Elevation Frame over top side of BP-212 Subwoofer. Please, be sure that rigging plates are well placed inside lateral frame grooves.

3.- Use 4 optional quick-lock pins to set Elevation Frame to first “flown” BP-212 subwoofer as shown in right drawing

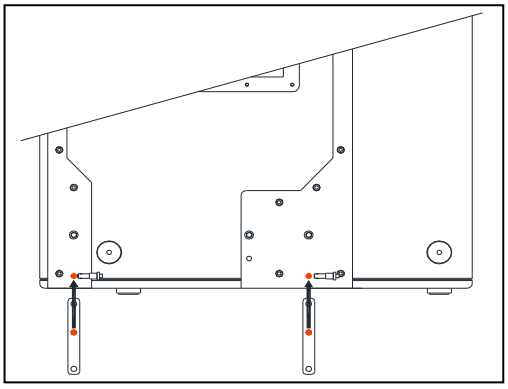
4.- If 1 or 2 hoist are avalible, please carefully raise first BP-212 unit fixed through Elevation Frame until an adequate height to place second BP-212 below first “flown” unit.

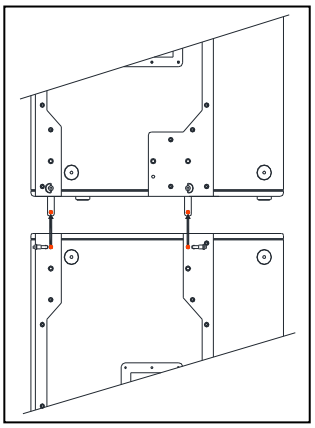
5.- Fix 4 rigging pieces in bottom side of “flown” BP-212 (2

front and 2 rear) inside rigging tubes as shown in left drawing using marked holes.

Use 4 quick-lock pins to secure them in both sides of first “flown” BP-212.

Place second BP-212 unit just underneath first BP-212 unit already “flown”.





6.- Use hoist to descend very carefully first “flown” BP-212 matching 4 bottom rigging pieces with 4 second BP-212 tubes as shown in left side drawing. Please, check that holes in both rigging pieces and BP-212 rigging plates match perfectly.

Finally, fix and secure both BP-212 junction using 4 quick-lock pins. Please, refer to drawing.

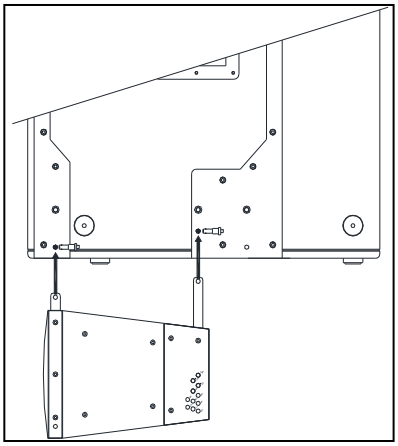
Now, raise carefully again both BP-212 using your hoists.

Please, follow this steps to fly as much BP-212 as necessary.

Next, Douglas-8 line-array elements will be fixed underneath BP-212 to configure complete flown Douglas-8000 system.

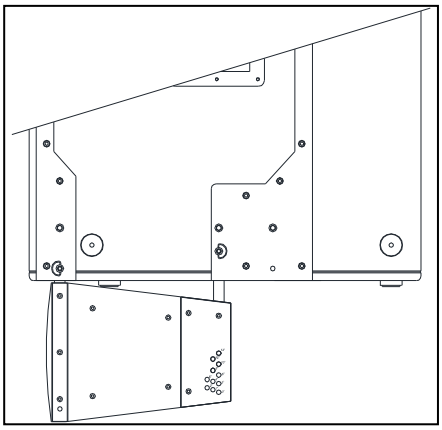
7.- Now, place first Douglas-8 line-array element underneath last flown BP-212.

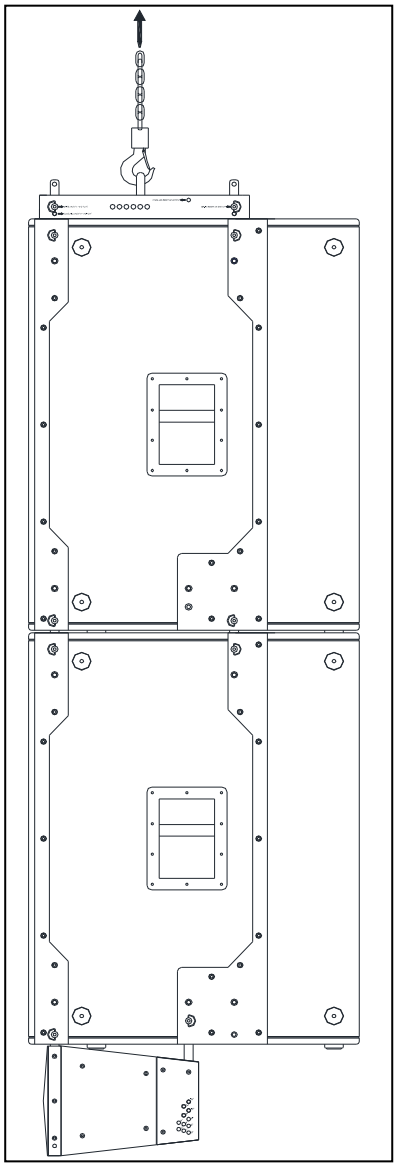
Introduce Douglas-8 front and rear rigging pieces inside BP-212 rigging tubes as shown in left drawing.



Use 4 quick-lock pins (2 front and 2 rear) to securely fix first line-array unit to last flown BP-212 subwoofer.

Figure shows fixing points for this tasks.





15.5.- DOUGLAS-8000 FLIGHT-CASE

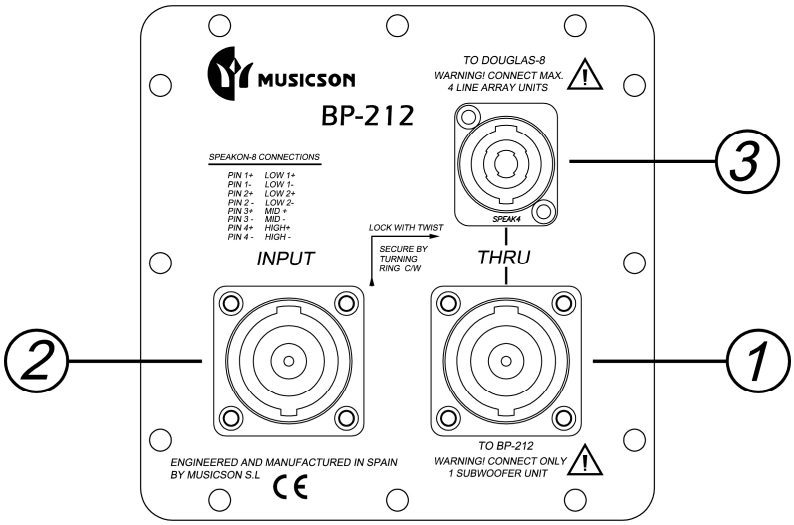
Musicson has developed also a dedicated transport and protection Douglas-8 line-array elements Flight-case. A maximum number of 5 elements can be used. Flight-case features 4 wheels for transport. To ensure stability, transportation should be handled in horizontal position as shown in figure.

Douglas-8 line-array inside flight-case should be fixed in **0º** splay angles to reduce total needed load volume.

In case of only 4 Douglas-8 line-array fixed in transport flight-case, an optional wooden case can be supplied for cables, connectors or other accessories storage.

16.- DOUGLAS-8000 CONNECTIONS

Musicson has developed all system connections plates to avoid any mistake that may be dangerous for transducers and amplifiers security, making also much easier Douglas-8000 system connection tasks. BP-212 Rear Panel features all necessary Speakon connectors and inside cabling to send correct amplifier outputs to all Douglas-8000 system components.



1.- INPUT Neutrik (8-pin) Speakon NL8MPR.

Douglas-8000 system Amplified signal Input
From MX-8000D amplifier through supplied 8 wires special cable. Each wire has its own necessary section to avoid power losses . A total number of 4 (8-pin) cables will be supplied: 2 for BP-212 to MX-8000D amplifier connection ans another 2 for first BP-212 to second BP-212 unit connection.

2.- THRU (TO BP-212) Neutrik (8-pin) Speakon NL8MPR.

In case of 2 BP-212 units used in each channel, this powered output will send signal to auxiliary BP-212.

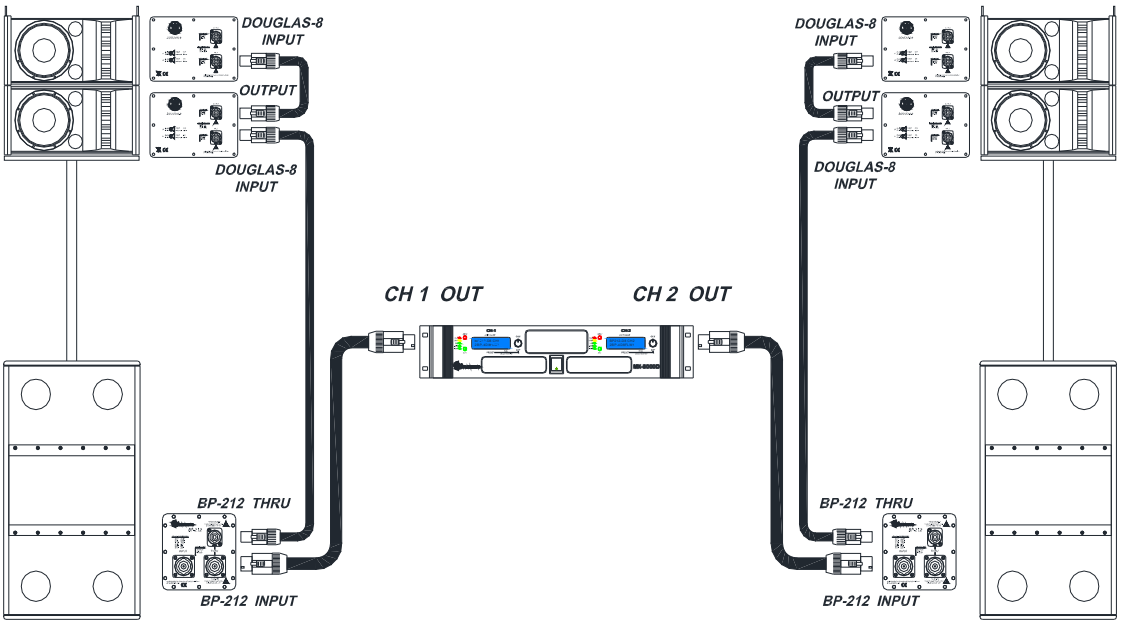
3.- THRU (TO DOUGLAS-8) Neutrik (4-pin) Speakon NL4MP

Amplified Output Signal (2 active way) to power up to 5 DOUGLAS-8 line-array elements paralleled connected.

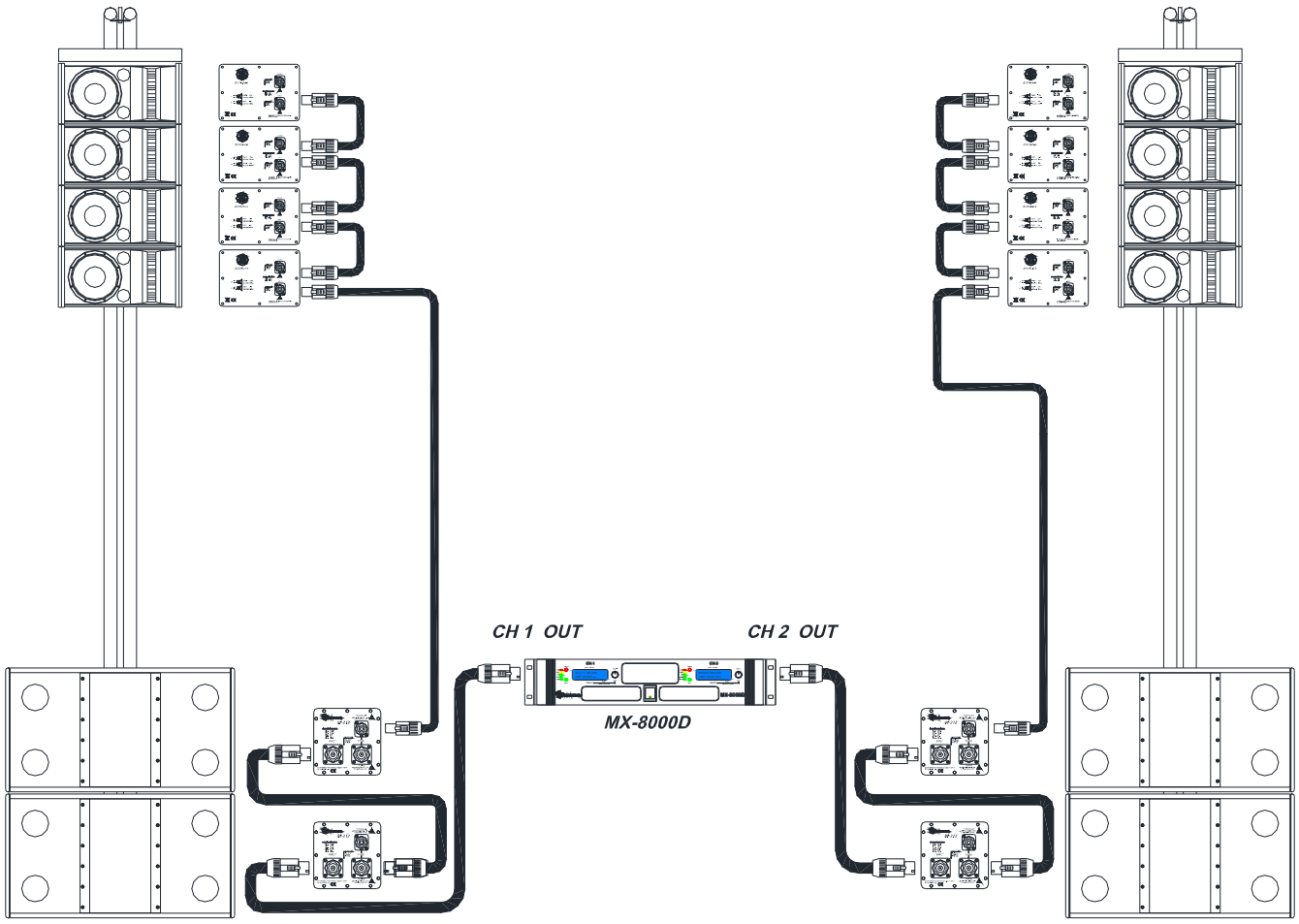
Please, refer to each DOUGLAS-8000 component (BP-212 subwoofer, Douglas-8 Line-array and MX-8000D Amplifier) INTRODUCTION to check about NL8MPR and NL4MP Speakon connectors pin codes.

Next, you will find some drawings with 2 DOUGLAS-8000 conguration connections for user reference.

Note!: cables and connectors proportions does not correspond to real measures. A 2:1 scale has been used to represent Douglas-8 and BP-212 Rear connector panels as well as MX-8000D Amplifier.



Basic 1 BP-212 subwoofer unit and 2 and Line-array Douglas-8 elements used each MX-8000D Amplifier.

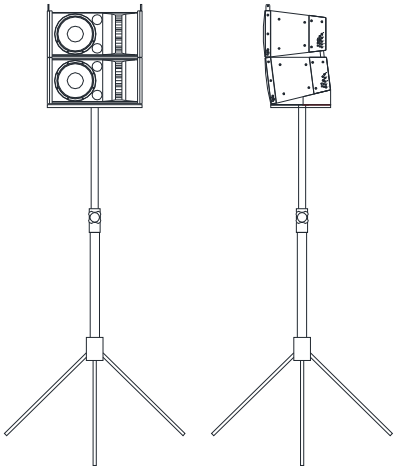


DOUGLAS-8000 with maximum number of 2 BP-212 and 4 Douglas-8 used each MX-8000D Amplifier channel.

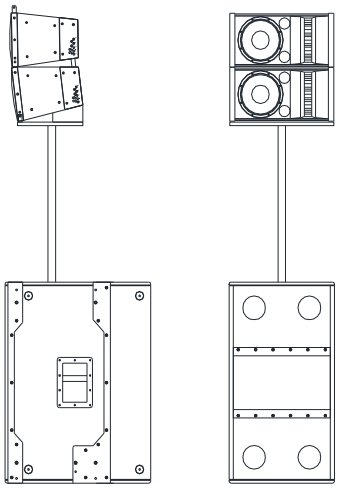
17.- DOUGLAS 8000 CONFIGURATION EXAMPLES

DOUGLAS-8000 system has been designed together a wide variety of accessories, including light-weight 4.5 meters height Douglas-8000 Tower, to configure system for many purposes.

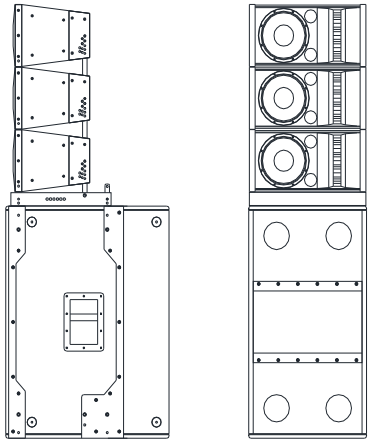
All this possible configuration are referred to a single **MX-8000D** Amplifier Channel.



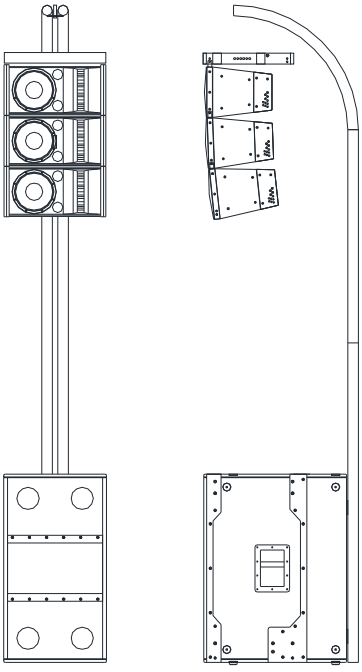
STAND-ALONE DOUGLAS-8



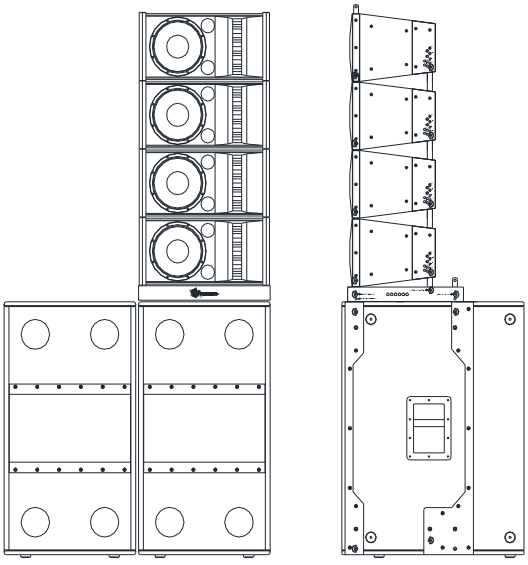
2 or 3 flown DOUGLAS-8 WITH STAND in 1 BP-212



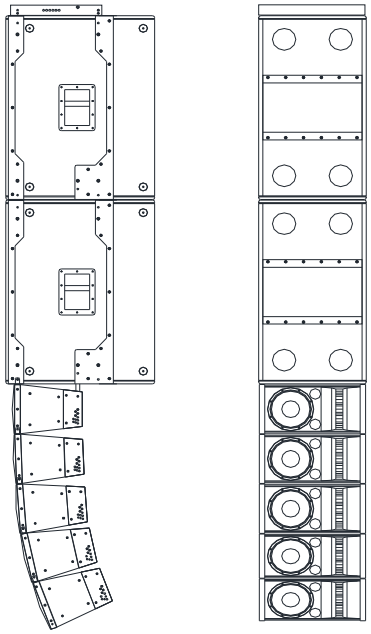
2 or 3 stacked DOUGLAS-8 in 1 BP-212



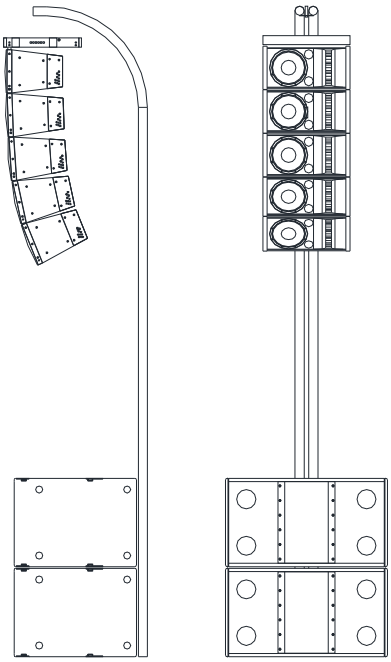
2 or 3 DOUGLAS-8 flown with DOUGLAS-8000 Tower fixed on 1 BP-212



From 3 to 5 DOUGLAS-8 stacked in 2 BP-212



FLOWN DOUGLAS-8000. Using 2 BP-212
and up to a maximum number of 5 DOUGLAS-8



Up to 5 flown DOUGLAS-8 over 2 BP-212

18.- MUSICSON LIMITED WARRANTY

MUSICSON products like DOUGLAS-8000 system are guaranteed for two years from the date of original purchase and covers all defects in material and workmanship, including, enclosures, MX-8000D Amplifier and DSP modules and devices.

All DOUGLAS-8000 user must preserve original shipping cartons in case of unit should be sent to Factory. In other cases, Musicson will charge new carton if needed.

In case of damaged cabinet could not be sent to Factory for checking or repairing, Musicson will supply all necessary parts to replace damaged ones. Musicson Technical Department will be the last responsible to send pieces or repair any product under warranty after checking. Please, do not ship any Musicson product to the factory without authorization.

Following aspects are not covered by warranty: product modifications, neglect actions, damages caused by improper use even during shipment; Musicson warranty will not cover any non-authorized repair.

Please, contact Musicson for any further information about this section.

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